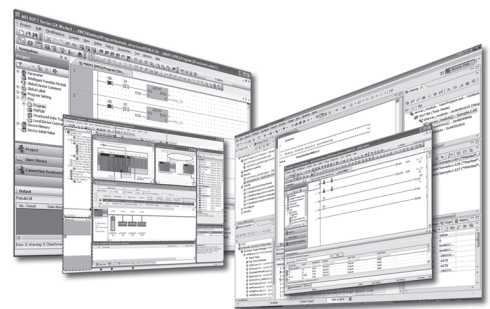


Engineering Software

# CW Workbench/CW-Sim Operating Manual

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-SW1DND-CWWR-E  
-SW1DND-CWSIMR-EZ  
-SW1DNC-CWSIMSAR-E



**Powered by**  
**WIND RIVER**

CW Workbench and CW-Sim were jointly developed by Mitsubishi and Wind River Systems, Inc.



# SAFETY PRECAUTIONS

---

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

The precautions given in this manual are concerned with this product only. For the safety precautions for the programmable controller system, refer to the user's manual for the module used and the MELSEC iQ-R Module Configuration Manual.

In this manual, the safety precautions are classified into two levels: "⚠ WARNING" and "⚠ CAUTION".

---

## **WARNING**

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.

---

## **CAUTION**

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

---

Under some circumstances, failure to observe the precautions given under "⚠ CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

## [Design Precautions]

---

### **WARNING**

- When handling external devices and performing the following operations, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.

- (1) Changing data in the running C Controller module from the connected personal computer
- (2) Changing the operating status
- (3) Operating from a personal computer

Especially, in the case of a control from an external device to a remote C Controller module, immediate action cannot be taken for a problem on the C Controller module due to a communication failure.

To prevent this, configure an interlock circuit in a user program, and determine corrective actions to be taken between the external device and C Controller module in case of a communication failure.

---

## [Startup and Maintenance Precautions]

---

### **WARNING**

- When handling external devices and performing the following operations, configure an interlock circuit in a user program to ensure that the entire system will always operate safely.

- (1) Changing data of the running C Controller module from the connected personal computer
- (2) Changing the operating status
- (3) Operating from a personal computer

Especially, in the case of a control from an external device to a remote C Controller module, immediate action cannot be taken for a problem on the C Controller module due to a communication failure.

To prevent this, configure an interlock circuit in a user program, and determine corrective actions to be taken between the external device and C Controller module in case of a communication failure.

---

## [Startup and Maintenance Precautions]

---

### **CAUTION**

---

- Before performing online operations (especially, program modification, forced output, and operation status change) for the running C Controller module from the peripheral devices connected, read relevant manuals carefully and ensure the safety. Improper operation may damage machines or cause accidents.
  - When connecting any external device during operations of CW-Sim and CW-Sim Standalone, ensure that the operation is safe before proceeding. Improper operation may damage machines or cause accidents.
-



# CONDITIONS OF USE FOR THE PRODUCT

---

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;

- i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
- ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.

MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.

("Prohibited Application")

Prohibited Applications include, but not limited to, the use of the PRODUCT in;

- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTS are required. For details, please contact the Mitsubishi representative in your region.

# INTRODUCTION

---

Thank you for purchasing CW Workbench and CW-Sim.

This manual describes the procedures for operations, system configurations, and troubleshooting when using CW Workbench and CW-Sim.

Before using the product, please read this manual and relevant manuals carefully and develop familiarity with the performance of CW Workbench and CW-Sim to handle the product correctly.

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# RELEVANT MANUALS

Manual name [manual number]	Description	Available form
CW Workbench/CW-Sim Operating Manual [SH-081373ENG] (this manual)	Explains the system configuration, specifications, functions, and troubleshooting of CW Workbench/CW-Sim.	e-Manual EPUB PDF
MELSEC iQ-R C Controller Module User's Manual (Startup) [SH-081367ENG]	Explains the performance specifications, module startup procedure, and troubleshooting of C Controller module.	Print book e-Manual EPUB PDF
MELSEC iQ-R C Controller Module User's Manual (Application) [SH-081369ENG]	Explains the functions, devices, and parameters of C Controller module.	Print book e-Manual EPUB PDF
MELSEC iQ-R C Controller Module Programming Manual [SH-081371ENG]	Explains the programming specifications and dedicated functions of C Controller module.	e-Manual EPUB PDF
CW Configurator Operating Manual [SH-081382ENG]	Explains the system configuration, parameter settings, and operation methods for the online function of CW Configurator.	e-Manual EPUB PDF



e-Manual refers to the Mitsubishi FA electronic book manuals that can be browsed using a dedicated tool.

e-Manual has the following features:

- Required information can be cross-searched in multiple manuals.
- Other manuals can be accessed from the links in the manual.
- The hardware specifications of each part can be found from the product figures.
- Pages that users often browse can be bookmarked.

# TERMS

Unless otherwise specified, this manual uses the following terms.

Term	Description
CW Configurator	A generic product name for model names, SWnDND-RCCPU ('n' indicates version.)
CW Workbench	An abbreviation for C Controller module engineering tool, CW Workbench
CW-Sim	An abbreviation for VxWorks simulator that can operate and debug the C Controller module programs on a personal computer with CW Workbench installed, without connecting to the actual machine (target)
CW-Sim Standalone	An abbreviation for VxWorks simulator that is operable on a personal computer without CW Workbench installed
C Controller module	A generic term for MELSEC iQ-R series C Controller module
C Controller module dedicated function	A dedicated function library offered by C Controller module It controls C Controller module.
Eclipse	An open-source integrated development environment written in Java
MELSEC data link function	A dedicated function library offered by C Controller module It is used to access other CPU modules as a connection target via network or in a multiple CPU system.
R12CCPU-V	An abbreviation for R12CCPU-V C Controller module
RTP	An abbreviation for Real Time Process Project; that is one of the project types of Wind River's Workbench A technology capable of executing user application in user space
VxSim	A generic term for the VxWorks simulator functions of Wind River Workbench
VxWorks	A product name for the real-time operating system manufactured by Wind River Systems, Inc.
Wind River Workbench	A generic term for Wind River Workbench manufactured by Wind River Systems, Inc.
Windows® 7	A generic term for Microsoft® Windows® 7 Professional Operating System, Microsoft® Windows® 7 Ultimate Operating System, and Microsoft® Windows® 7 Enterprise Operating System
Windows® 7 or later	A generic term for Windows® 7, Windows® 8, and Windows® 8.1
Windows® 8	A generic term for Microsoft® Windows® 8 Operating System, Microsoft® Windows® 8 Pro Operating System, and Microsoft® Windows® 8 Enterprise Operating System
Windows® 8.1	A generic term for Microsoft® Windows® 8.1 Operating System, Microsoft® Windows® 8.1 Pro Operating System, and Microsoft® Windows® 8.1 Enterprise Operating System
Windows® 8 or later	A generic term for Windows® 8 and Windows® 8.1
Windows® XP	A generic term for Microsoft® Windows® XP Professional Operating System
Installation key file	A file to install CW Workbench/CW-Sim with no license. It is stored on the DVD-ROM of CW Workbench/CW-Sim.
Existing CW Workbench	A generic term for Q24DHCCPU-V, Q24DHCCPU-VG, and C Controller module engineering tool for Q12DCCPU-V, CW Workbench <ul style="list-style-type: none"> <li>• For Q24DHCCPU-V and Q24DHCCPU-VG SW1DND-CWWLQ24-E, SW1DND-CWWLQ24-EZ, and SW1DND-CWWLQ24-EVZ</li> <li>• For Q12DCCPU-V SW1DND-CWWLQ12-E, SW1DND-CWWLQ12-EZ, and SW1DND-CWWLQ12-EVZ</li> </ul>
Dedicated function library	A generic term for C Controller module dedicated functions and MELSEC data link functions



# PART 1

# FUNDAMENTALS OF CW Workbench/CW-Sim

## PART 1

This part explains the features and system configuration of CW Workbench and CW-Sim.

1 BEFORE USING PRODUCTS

---

2 SYSTEM CONFIGURATION

---

# 1 BEFORE USING PRODUCTS

This chapter explains the overview of CW Workbench, CW-Sim, and CW-Sim Standalone.

## 1.1 CW Workbench

CW Workbench is a product to develop user programs that operate on C Controller module.

CW Workbench is an OEM product of Wind River Systems, Inc. The product has only basic functions required for user program development, such as coding, building, and debugging, as a subset product of Wind River Workbench 3.3.

### Features

CW Workbench has the following features:

#### **Dedicated integrated development environment for C Controller module**

CW Workbench provides an integrated development environment to perform operations such as project management and editing, building, and source code debugging. Therefore, an effective user program for C Controller module can be developed.

#### **Same specifications as those of Wind River Workbench 3.3**

The specifications of CW Workbench regarding displays and operations for the function are same as Wind River Workbench 3.3.

#### **Windows®-supported operating system of personal computer**

CW Workbench is supported by Windows® XP, Windows® 7, and Windows® 8. Some 64-bit version operating systems are also supported. For more details, refer to the following section.

☞ Page 22 Operating Environment

#### **Extended functions using plug-in software**

The third party plug-in software can be easily added, which allows functions to be easily extended.

## 1.2 CW-Sim and CW-Sim Standalone

CW-Sim and CW-Sim Standalone are products which allow to simulate SW programs of VxWorks on a personal computer. CW-Sim is used as an add-on to CW Workbench.

CW-Sim Standalone is a runtime environment that enables the VxWorks simulation function on a personal computer on which CW Workbench has not been installed.

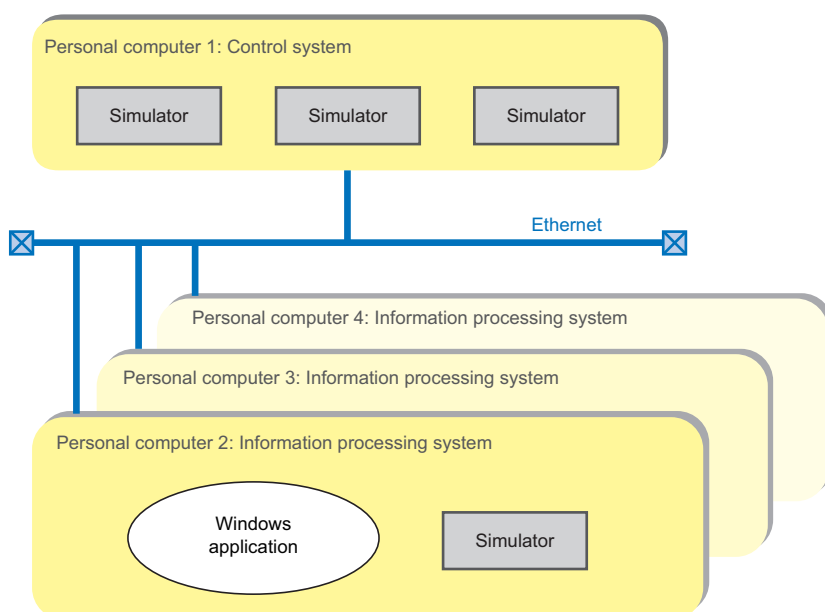
CW-Sim and CW-Sim Standalone are OEM products of Wind River Systems, Inc. The product has only basic functions (VxSim) required for simulation, as a subset product of Wind River Workbench 3.3.

The screen display and operations of the common functions are all the same as those for Wind River Workbench.

### Features

CW-Sim/CW-Sim Standalone has the following features:

- VxWorks system can be simulated without C Controller module.
- The program quality and device safety can be improved before actual operations.
- It can be used for debugging of a system consisting of more than one personal computer and training.



#### Point

Since the system functions such as C Controller module dedicated functions and MELSEC data link functions are not supported by CW-Sim/CW-Sim Standalone, creation of system function stub in accordance with the application or deletion of the caller of the system function is required.

To debug any program which contains a dedicated function library provided by C Controller module, creating the stub is required.


The sample stub program is stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

## 1.3 Procedure Overview

The following describes the operating procedure from installation up to debugging.

### CW Workbench


1. Acquire a permanent license.

 Page 27 Acquiring/Reacquiring Permanent License



2. Install CW Workbench.


Permanent license file	: Present	Install CW Workbench using a permanent license.
Permanent license file	: Absent	Install CW Workbench using a temporary license.
Internet connection	: Present	
Permanent license file	: Absent	Install CW Workbench using an installation key file.
Internet connection	: Absent	

 Page 30 Installation



3. Apply a permanent license.

When installing CW Workbench using a temporary license or an installation key file, apply a permanent license which will be sent later to a personal computer.

 Page 37 Applying Permanent License



4. Apply a patch.

Please consult your local Mitsubishi representative to obtain a patch file.

 Page 37 Applying Patch



5. Create a project.

Start CW Workbench.


Create a project for user program.

Perform programming.

 Page 50 Creating New Projects



6. Build a user program.

 Page 62 Building Project



7. Connect with a C Controller module.

 Page 66 Setting Target Server



8. Download user program to C Controller module.

 Page 72 Downloading Module for Debugging




9. Debug a user program.

 Page 74 Debugging User Programs

# CW-Sim


1. Acquire a permanent license.

 Page 27 Acquiring permanent license



2. Install CW-Sim. (CW-Sim is installed at the same time as the installation of CW Workbench.)


Permanent license file	: Present	Install CW Workbench using a permanent license.
Permanent license file	: Absent	Install CW Workbench using a temporary license.
Internet connection	: Present	

 Page 30 Installation



3. Apply a permanent license.

When installing CW-Sim using a temporary license, apply a permanent license which will be sent later to a personal computer.

 Page 37 Applying Permanent License



4. Apply a patch.

Please consult your local Mitsubishi representative to obtain a patch file.

 Page 37 Applying Patch



5. Create a project.

Start CW Workbench.


Create a project for user program.

Perform programming.

 Page 50 Creating New Projects






6. Build a user program.

 Page 62 Building Project



7. Connect to CW-Sim.

 Page 81 Setting VxWorks Network Daemon  
 Page 89 Starting VxWorks Network Daemon  
 Page 90 Starting Simulator




8. Debug a user program.

 Page 74 Debugging User Programs

1. Install CW-Sim Standalone.

Copy an execution file from the CD-ROM to the local folder on a personal computer.

 Page 40 Installation




2. Create a project.

Start CW Workbench.

Create a project for user program.

Perform programming.

 Page 50 Creating New Projects




3. Build a user program.

 Page 62 Building Project



4. Connect to CW-Sim Standalone.

 Page 81 Setting VxWorks Network Daemon

 Page 93 Starting VxWorks Network Daemon

 Page 94 Starting Simulator



5. Execute a user program.

 Page 74 Debugging User Programs

# 2 SYSTEM CONFIGURATION

This chapter explains the system configuration of CW Workbench, CW-Sim, and CW-Sim Standalone.

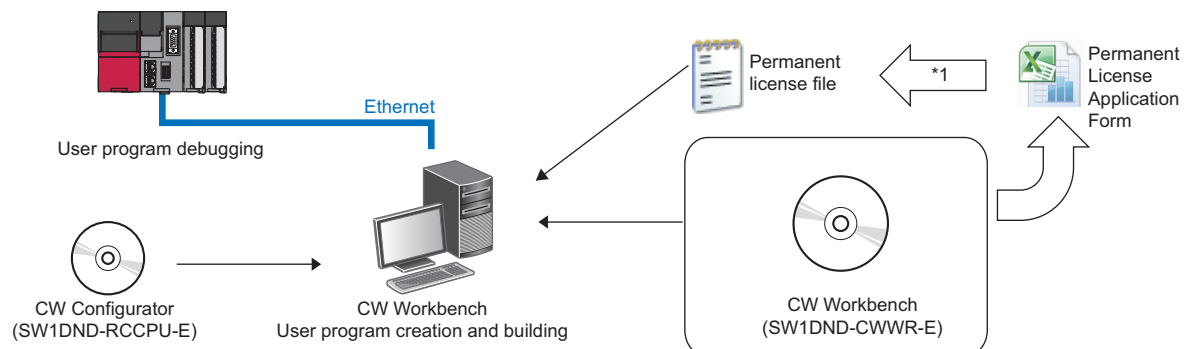
## 2.1 Configurations

### CW Workbench

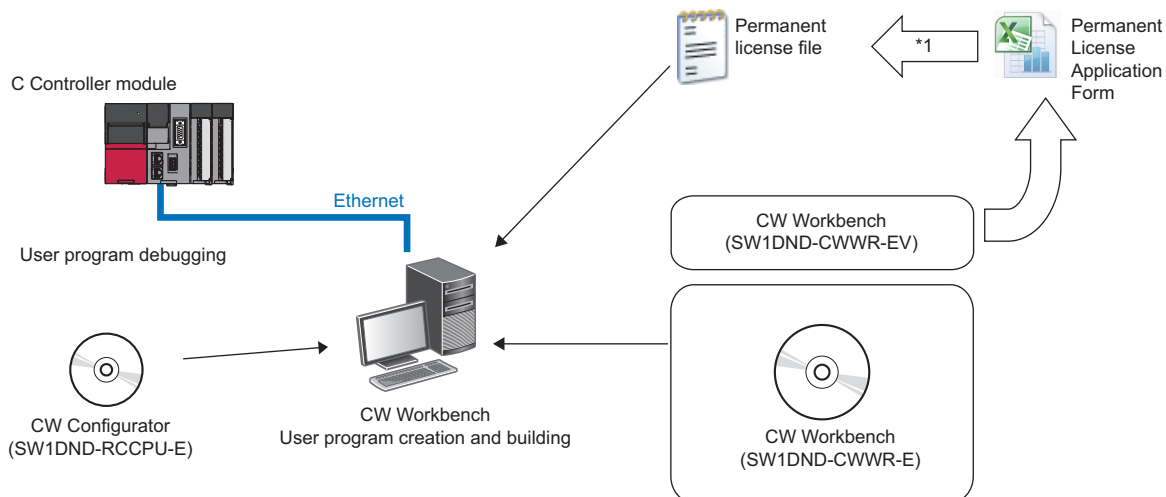
The following shows the environment for developing user programs with CW Workbench.

#### Product with license

C Controller module

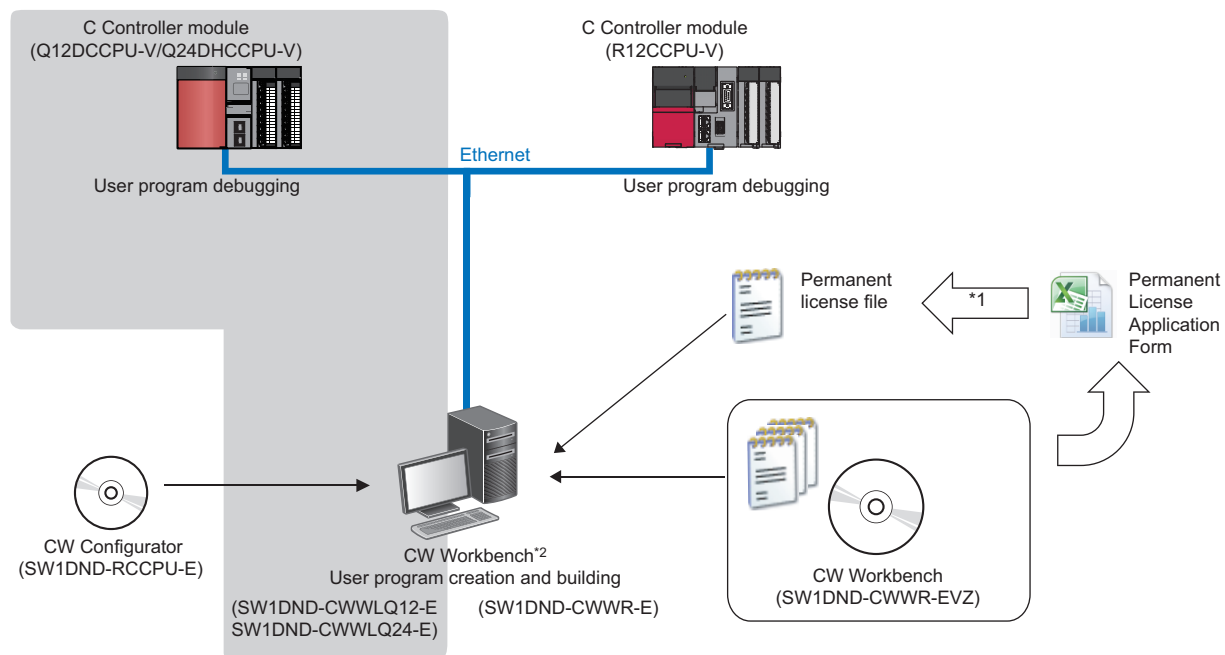


#### Additional license product





## Updated license product



\*1 A permanent license is required to install CW Workbench.

\*2 Install SW1DND-CWWR-E in a different folder from the one with SW1DND-CWWLQ12-E/SW1DND-CWWLQ24-E. Note that SW1DND-CWWLQ12-E/SW1DND-CWWLQ24-E and SW1DND-CWWR-E cannot be run at the same time.

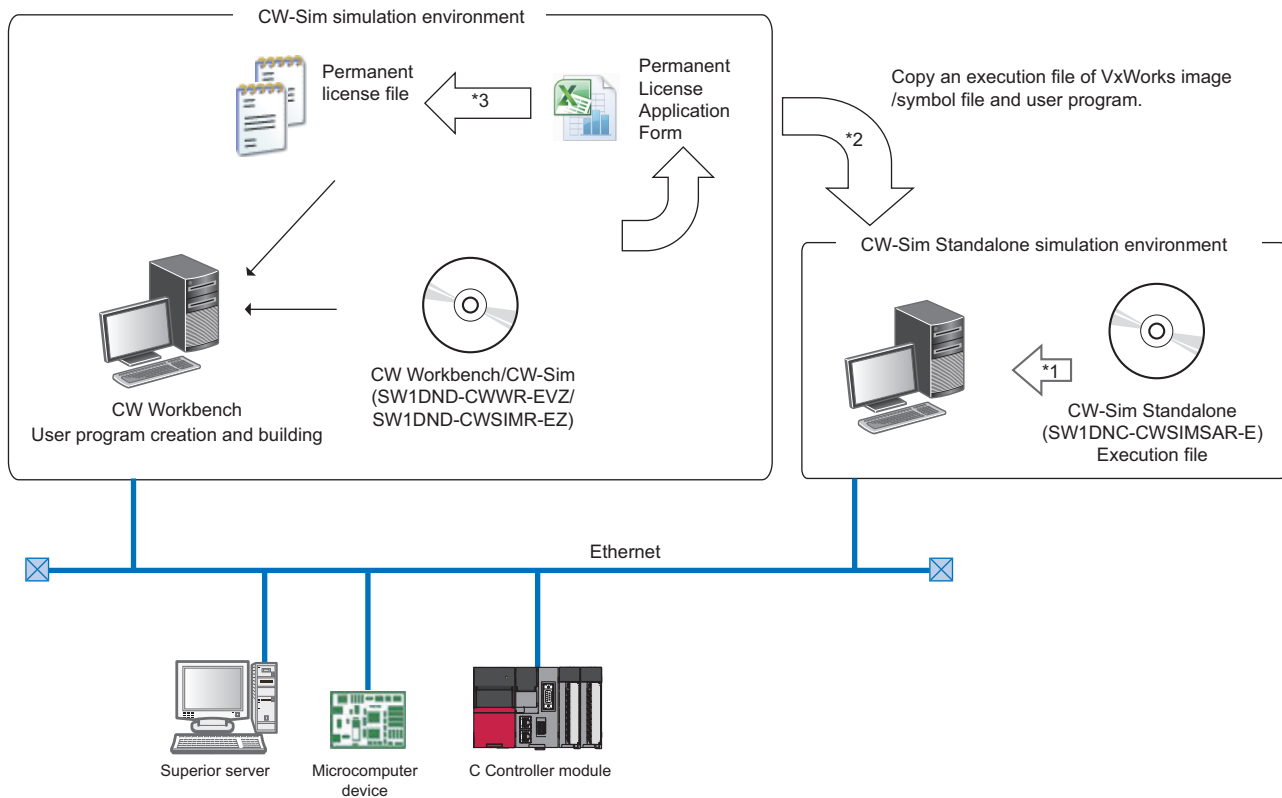
### Point

If the CPUs, which are to be used after update, are not described in "Target CPU" of the Permanent License Application Form, please consult your local Mitsubishi representative.

## CW-Sim and CW-Sim Standalone

The simulation environment of CW-Sim is established by installing CW Workbench/CW-Sim on a personal computer. The simulation environment of CW-Sim Standalone is established using the execution file of CW-Sim Standalone<sup>\*1</sup> and VxWorks image/symbol files<sup>\*2</sup>.

Programs running on the simulator can be interlocked with superior server, microcomputer device, and C Controller module via Ethernet.



\*1 The execution file of CW-Sim Standalone can be copied from CW-Sim Standalone CD-ROM (SW1DNC-CWSIMSAR-ECD).

\*2 The VxWorks image/symbol files can be copied from the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

\*3 The permanent licenses are required for each of CW Workbench and CW-Sim.

## Available communication route for CW-Sim/CW-Sim Standalone

Windows applications running on the simulator communicate via the virtual network of the simulator or Ethernet.

The following information with figure explains the communication routes available for applications running on the simulator.

### ■Between the simulators on the same personal computer

Ex.

The route (1) in the figure below

### ■Between the simulator and the other application on the same personal computer

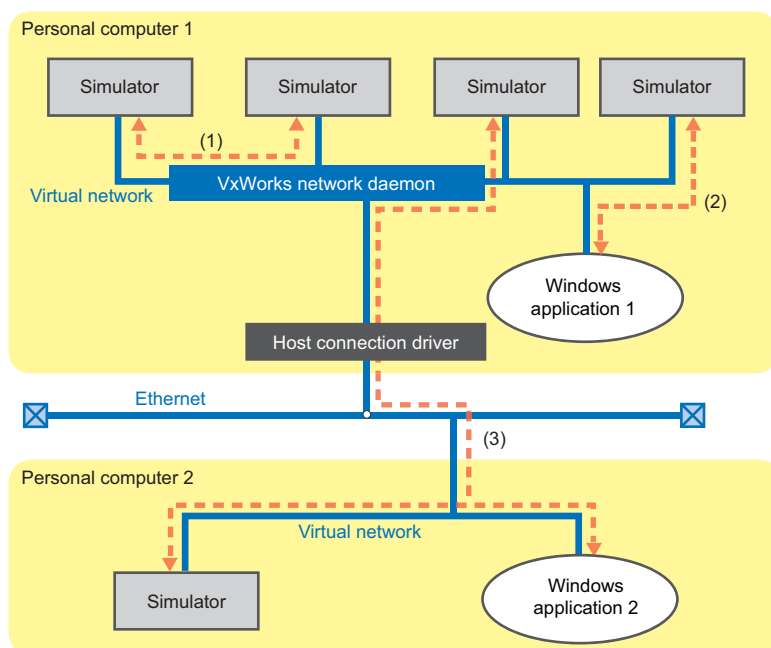
Ex.

The route (2) in the figure below

### ■Between the simulator and other applications on a different personal computer

Ex.

The route (3) in the figure below



Item	Description
VxWorks network daemon	A software (vxsimnetd) to establish the virtual network between the simulators
Host connection driver	A software that is a gateway to connect the virtual network established using the VxWorks network daemon to Ethernet

### Point

The specifications of the sample program stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) are as follows:

- Four programs are simulated on a single personal computer.
- A program communicates with other programs via the virtual network.
- Simulate the dedicated function library called from programs by executing the function in the stub (CCPU\_Simulator.c).

Page 96 USAGE EXAMPLE OF CW-Sim USING SAMPLE PROGRAM

## 2.2 Supported Modules

CW Workbench, CW-Sim, and CW-Sim Standalone support the module shown below.

Module model	Operating system type
R12CCPU-V	VxWorks 6.9

## 2.3 Operating Environment

The following table shows the operating environment of a personal computer on which CW Workbench, CW-Sim, and CW-Sim Standalone can run.

Item	Description	
Personal computer	A personal computer on which Windows® operates	
CPU	Intel® Core™ 2 Duo 2GHz or higher is recommended	
Memory requirements	64-bit version operating system	2 GB or more
	32-bit version operation system	1 GB or more (2 GB or more recommended)
Hard disk space	Install size	HDD 4 GB or more
	Executable size	Virtual memory 512 MB or more
Display	Resolution 1024 × 768 pixels or higher	
Disk drive	DVD-ROM drive	
Interface	Ethernet 10BASE-T/100BASE-TX/1000BASE-T	
Operating system <sup>*1*2*3</sup>	<ul style="list-style-type: none"><li>• Microsoft® Windows® 8.1 Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 8.1 Pro Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 8.1 Enterprise Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 8 Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 8 Pro Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 8 Enterprise Operating System (Japanese/English)<sup>*4</sup></li><li>• Microsoft® Windows® 7 Professional Operating System (Japanese/English)<sup>*5</sup></li><li>• Microsoft® Windows® 7 Ultimate Operating System (Japanese/English)<sup>*5</sup></li><li>• Microsoft® Windows® 7 Enterprise Operating System (Japanese/English)<sup>*5</sup></li><li>• Microsoft® Windows® XP Professional Operating System SP3 or later (Japanese/English)<sup>*6</sup></li></ul>	

\*1 The following functions cannot be used.

Application startup in the Windows® compatible mode  
Fast user switching  
Remote desktop  
Large fonts (detailed setting in the Display Properties)  
DPI setting other than 100%

\*2 To install/uninstall CW Workbench/CW-Sim, log on as a user with administrative privileges.

\*3 TCP/IP is required to be installed.

\*4 Windows Touch cannot be used.

\*5 Windows XP Mode cannot be used.

\*6 64-bit version is not supported.

## 2.4 Specifications

Item	Specifications		
	CW Workbench	CW-Sim	CW-Sim Standalone
Supported host operating system	Page 22 Operating Environment		
Supported C Controller module	R12CCPU-V		
Supported target operating system	VxWorks 6.9		None
Framework	Wind River Workbench 3.3 base (Eclipse3.6)		None
Project creation and management	VxWorks Downloadable Kernel Module Project	None	None
Building	GNU compiler (GCC for ARM Cortex A9)	GNU compiler (SIMNTgnu_SMP)	None
Debugger	<ul style="list-style-type: none"> <li>• Debugging execution restart</li> <li>• Debugging execution forced stop</li> <li>• Breakpoints</li> <li>• Step execution</li> <li>• Variables/structure variables reference and editing</li> <li>• Register value reference and editing</li> <li>• Memory block reference and editing</li> <li>• Target connection agent</li> <li>• Dynamic Printf</li> </ul>	None	None
License format	Node locked	Node locked	Runtime
Document	Wind River Workbench 3.3 Help document	Wind River VxWorks Simulator Help document	

### Differences from C Controller module

The differences between CW-Sim/CW-Sim Standalone and C Controller module that should be considered in user program development are as follows.

#### Floating point function

The hardware floating point function is not supported. Use the following ANSI floating point function.

##### ■Available ANSI floating point functions


acos, asin, atan, atan2, cos, cosh, exp, fabs, floor, fmod, log, log10, pow, sin, sinh, sqrt, tan, tanh

If any ANSI floating point function other than those listed above is used, a symbol error occurs in loading.

#### C Controller module dedicated function library

The dedicated function library (C Controller module dedicated functions, MELSEC data link functions) cannot be simulated. To debug any program containing these functions, create a stub or delete the caller.

##### Point

- The sample stub program is stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).
- For more information, refer to the following manual stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).  
 Wind River VxWorks Simulator User's Guide

## 2.5 Contents of DVD-ROM/CD-ROM

### CW Workbench/CW-Sim DVD-ROM

The CW Workbench/CW-Sim DVD-ROM stores the following items:

Folder path	Content	Description
\	Installation execution file	An installation file of CW Workbench and CW-Sim.
	Permanent License Application Form	An application form for acquiring a permanent license.
	Installation key file	A file to be used as an installation key when an internet is not connected and a permanent license file has not been acquired. If CW Workbench is installed using an installation key file (Install_ARM.txt), CW Workbench operates with no license.
\images	Installation image file	An installation image file of CW Workbench/CW-Sim.
\docs	Wind River Workbench manuals	Relevant manuals of VxWorks Simulator and Wind River Workbench 3.3 (PDF).
	VxWorks Simulator manuals	
\manual	CW Workbench/CW-Sim Operating Manual	Manual of MELSEC iQ-R CW Workbench/CW-Sim (e-Manual).
\e-Manual Viewer	Installation execution file (setup.exe)	An installation file of the browsing tool for e-Manual.
\3rd_party_license_notices	OS (vxworks-6.9.pdf) Communication protocols (mipc-2.2.pdf) Compiler (wrcompiler-5.9.1.pdf) Installer (installer-2.5.pdf)	A license notice (PDF) of the third party product used in CW Workbench and CW-Sim.
\src	CW Workbench open source file	An open source file of CW Workbench.
\include	C Controller module dedicated function (CCPUFunc.h)	A header file of dedicated function library.
	MELSEC data link function (MDFunc.h)	
\VxWorks	vxWorks_6_9_SMP vxWorks_6_9_SMP.sym	A VxWorks image file <sup>*1</sup> and a symbol file.
\Samples	Execution file, script file, batch file	A sample program for simulator.

\*1 The VxWorks image file contains Telnet and FTP services. To access these services, use the following account. (Account(s) can be added by using the loginUserAdd() function.)

User name: target

Password: password

### CW-Sim Standalone CD-ROM

The CW-Sim Standalone CD-ROM stores the following items:

Folder path, file name	Content	Description
\CWSIMSA	Execution file	An execution file of CW-Sim Standalone.
\readme.txt	—	How to acquire CW Workbench/CW-Sim Operating Manual is described.
\3rd_party_licensor_notices	OS(vxworks-6.9.pdf)	A license notice (PDF) of the third party product used in CW-Sim.
\Samples	Sample program	A sample program for the simulator

## PART 2

# INSTALLATION AND UNINSTALLATION

This part explains how to install and uninstall CW Workbench, CW-Sim, and CW-Sim Standalone.

3 INSTALLING CW Workbench/CW-Sim

---

4 INSTALLING CW-Sim Standalone

---

5 UNINSTALLING CW Workbench/CW-Sim

---

6 UNINSTALLING CW-Sim Standalone



---

# 3 INSTALLING CW Workbench/CW-Sim

This chapter explains how to install CW Workbench and CW-Sim.

## 3.1 Preparation for Installation

Before installing CW Workbench and CW-Sim, prepare the following items.

For preparation	Description
Development environment (personal computer)	<ul style="list-style-type: none"><li>• For the operating specifications of a personal computer, refer to "Operating Environment". (  Page 22 Operating Environment)</li><li>• Set the host name for the personal computer within 2 to 15 alphanumeric characters.</li><li>• To install CW-Sim, prepare a personal computer with CW Workbench installed.</li></ul>
CW Workbench/CW-Sim DVD-ROM	<ul style="list-style-type: none"><li>• Prepare the DVD-ROM included with the product with license (SW1DND-CWWR-E).</li><li>• The Permanent License Application Form stored on the DVD-ROM is used to apply for the permanent license.</li></ul>
License Agreement	An LAC (License Authorization Code) described on the License Agreement is required to install the products by using a temporary license. An LAC and a product ID described on the License Agreement are also required to apply for a permanent license. Prepare the License Agreement included with CW Workbench/CW-Sim.
Permanent license file	A permanent license file is required to install CW Workbench/CW-Sim by using a permanent license. The permanent license file must be acquired in advance by filling the Permanent License Application Form stored on the DVD-ROM and sending it to us.  Page 27 Acquiring/Reacquiring Permanent License
Internet connection	An internet connection is required to install CW Workbench/CW-Sim by using a temporary license. A 31-day temporary license can be acquired via the Internet.

## 3.2 Considerations for Installation

### Restriction

- When installing CW Workbench on the personal computer on which the existing CW Workbench has already been installed, install CW Workbench in a different folder from the one with the existing CW Workbench. Note that the existing CW Workbench and CW Workbench cannot be run at the same time.
  - Do not install CW Workbench on a personal computer where Wind River Workbench has been already installed. To install CW Workbench, uninstall the Wind River Workbench or prepare another personal computer.
- 
- Log on as a user with administrative privileges.
  - Stop all other applications running on Windows® before installation.
  - The installer may not operate properly due to the automatic start of update programs of the operating system or any other software, such as Windows® Update or Java Update. Change the setting to disable the automatic start of update programs before installation.
  - CW Workbench and CW-Sim can be installed at the same time. However, the permanent license for each of them is required.
  - Install CW Workbench and CW-Sim in the same installation destination. Otherwise, CW Workbench and CW-Sim may not operate properly.
  - When installing CW Workbench and CW-Sim separately, installation with different license format is not allowed. For example, when CW Workbench was installed by using the permanent license, install CW-Sim by using the permanent license as well.
  - An overwrite installation of CW Workbench or CW-Sim cannot be performed to a personal computer. Uninstall it first for re-installation.
  - Note the following when installing the updated license product:  
Enter the LAC (License Authorization Code) described on the License Agreement of the updated license product to LAC in the user information.



- While processing one "setup.exe", do not run other "setup.exe". Otherwise, the installation may not be completed properly. If the installation failed, uninstall CW Workbench and run "setup.exe" again.
- For installation on Windows® 7 or later, the confirmation dialog box of User Account Control appears. Click "Allow" or [Yes] button to continue the installation.

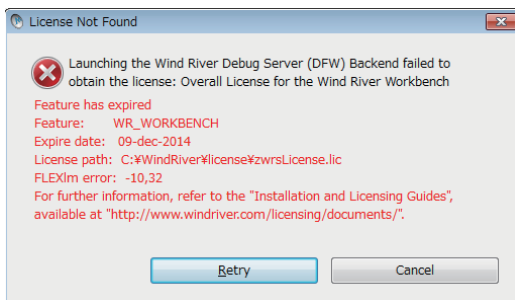
## Installation using temporary license

To install CW Workbench and CW-Sim by using a temporary license, check whether the personal computer can be connected to the Internet since a temporary license file is acquired via the Internet.

In addition, check the IP address and port number, which are acquired to be set during the installation, if the personal computer is connected to the Internet via a proxy server.

Once CW Workbench and CW-Sim are installed by using a temporary license, they operate for 31 days for trial. Apply the issued regular license by acquiring a permanent license. (☞ Page 27 Acquiring/Reacquiring Permanent License)

If CW Workbench and CW-Sim are used with the temporary license for more than 31 days, a license error message appears. They continue to operate by clicking the [Cancel] button; however, the project creation, compiling/ building, and debug functions cannot be used.



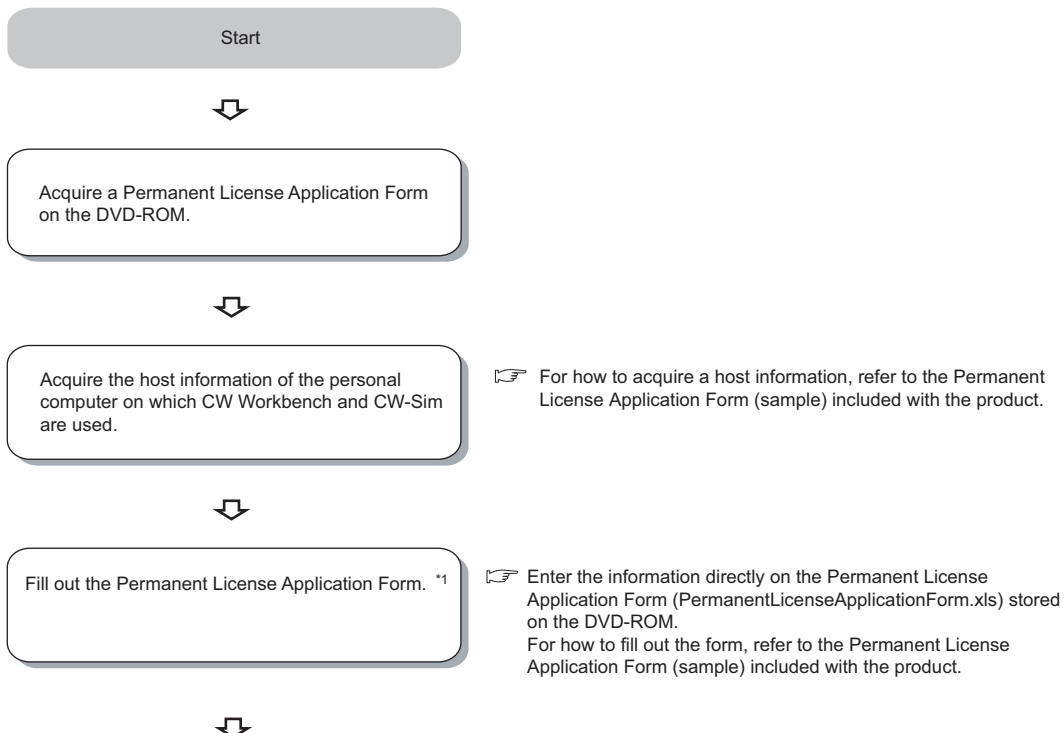
[License error message]  
Error text: "Feature has expired"  
Error code: -10

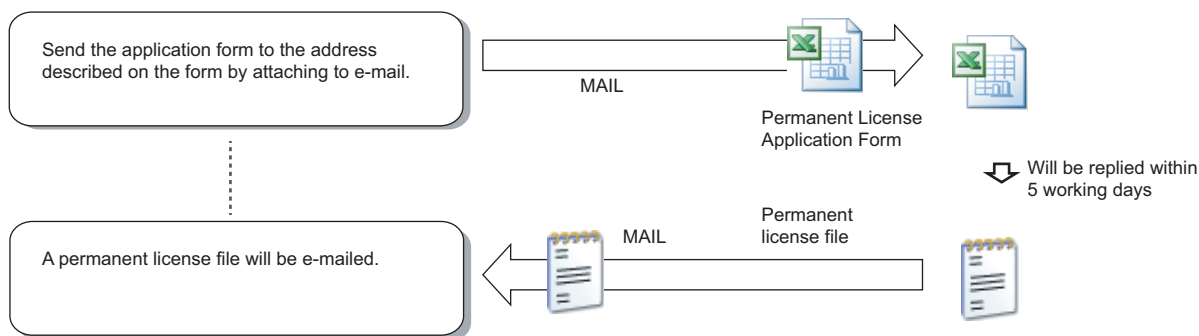
## 3.3 Acquiring/Reacquiring Permanent License

A permanent license is required to use CW Workbench and CW-Sim for unlimited duration.

### Acquiring permanent license

Acquire the permanent license according to the following instructions.





Page 37 Applying Permanent License

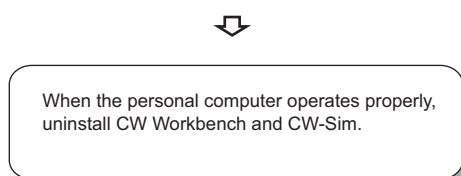
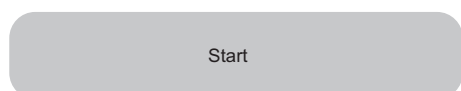


\*1 For the updated license product, enter the same host information as the one which has been registered to acquire the permanent license previously on the Permanent License Application Form .

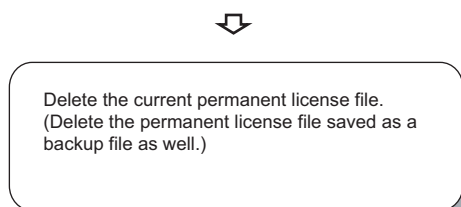
## Reacquiring permanent license (replacement of host machine)

A new permanent license is required for a new personal computer after the replacement due to the reason such as crash of a personal computer on which CW Workbench and CW-Sim have been installed.

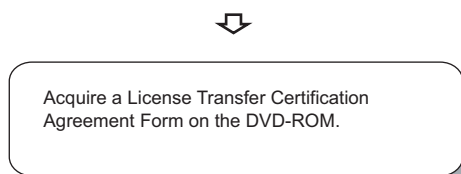
Reapply the permanent license according to the following instructions to replace the host machine.

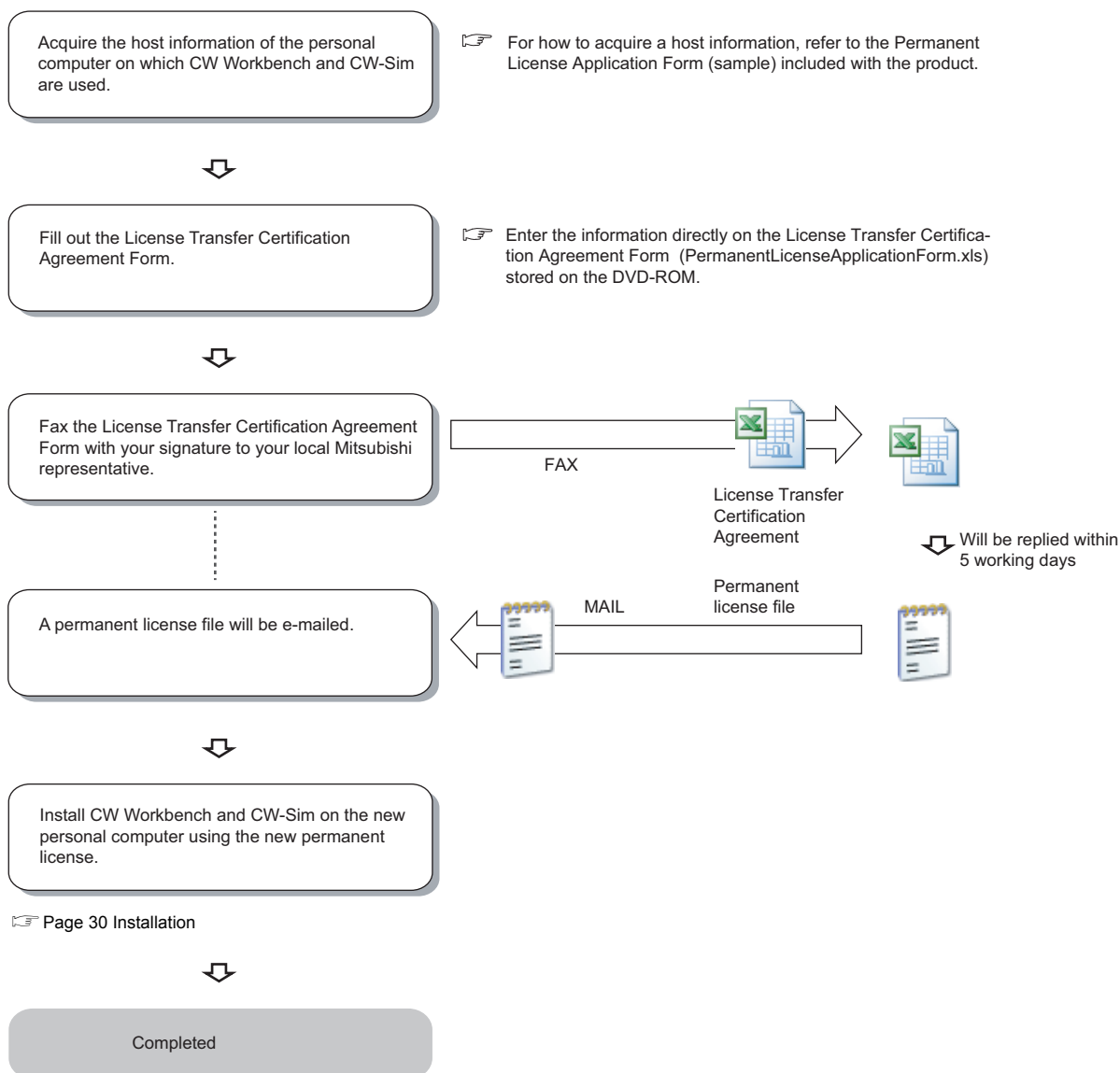


Page 43 Uninstallation



Page 42 Deleting Permanent License





### Point

If the License Agreement has been lost and the Product ID is unknown, consult your local Mitsubishi representative with the following information which was filled in on the Permanent License Application Form.

- Company name, department name, and name of the representative person
- E-mail address
- Target CPU

## 3.4 Installation

This section explains the installation procedure and operation method of CW Workbench and CW-Sim. The procedure shown below with the screens are of Windows® 7, it may differ depending on the operating system.

### Installation procedure

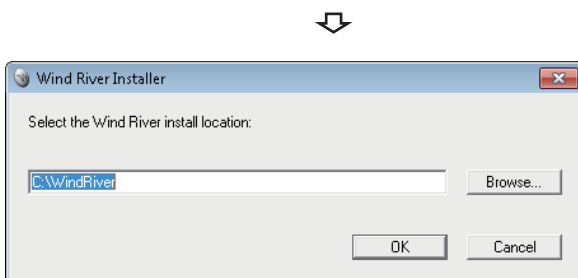
#### Operating procedure

1. Insert the CW Workbench/CW-Sim DVD-ROM into the DVD drive to start the installer.

If the installer is not started automatically, double-click "setup.exe" in the DVD-ROM to run the installer.

For the contents of the DVD-ROM, refer to the following section.

📖 Page 24 Contents of DVD-ROM/CD-ROM



2. Enter an installation destination folder name, click the [OK] button.

An installation destination folder can also be selected from the tree view by clicking the [Browse] button.

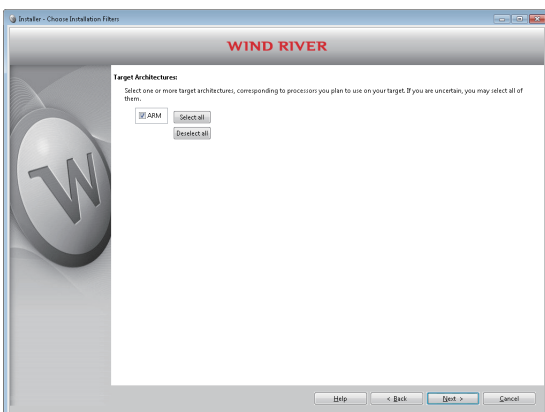
The following characters can be used for an installation destination folder name:

- Alphanumeric characters (Space cannot be used)
- Hyphen "-"
- Underscore "\_"

The product cannot be installed properly if characters other than those described above are used for a folder name. When installing CW-Sim separately, note that the same folder as the CW Workbench installation destination must be selected.



3. Click the [Next] button.



**4.** Click the [Next] button.

When the personal computer is connected to the Internet via a proxy server, select the "Connect to internet using proxy server", and configure the proxy server set for the Internet connection.

**5.** Click the [Next] button.

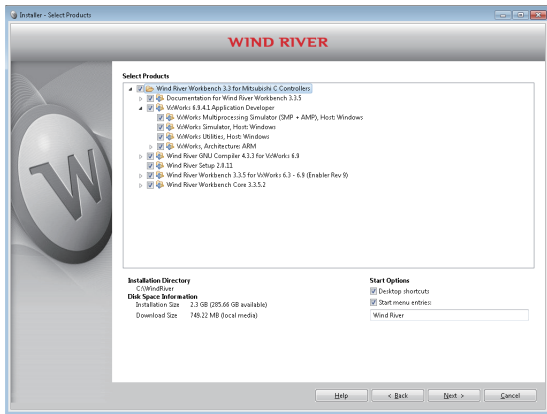
**6.** When the permanent license file is acquired, select "Permanent activation", and click the [Browse] button. Then, select the permanent license file of the product to be installed from the tree.

If the permanent license file has not been acquired, perform any of the following procedures.

- For environment where Internet connection is available: Page 34 Installation with a temporary license
- For environment where Internet connection is not available: Page 35 Installation using installation key file

**7.** Click the [Next] button.

**8.** Then, select "ARM", and click the [Next] button.

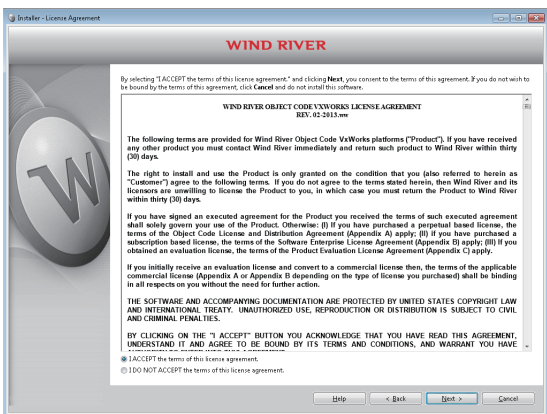


**9.** Check that all the items are selected, and click the [Next] button.

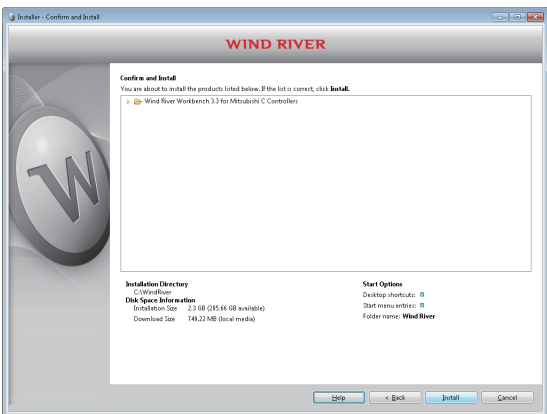
If no installation of CW-Sim is required, then unselect the following item.

- "VxWorks Simulator, Host: Windows"

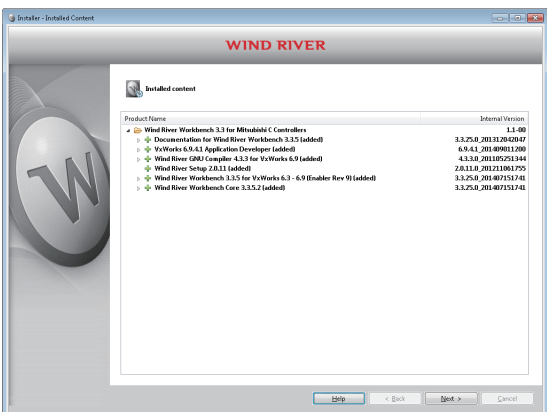
CW-Sim can be installed without having a license of CW-Sim.



**10.** Select "I ACCEPT the terms of this license agreement." and click the [Next] button.



**11.** Click the [Install] button.



**12.** Click the [Next] button.



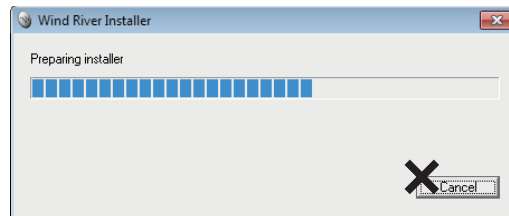
**13.** Click the [Finish] button.



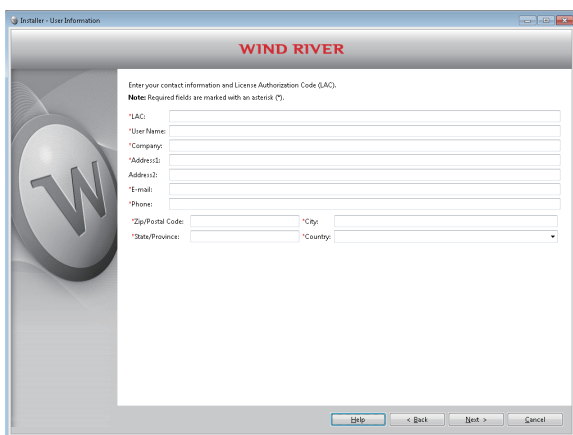
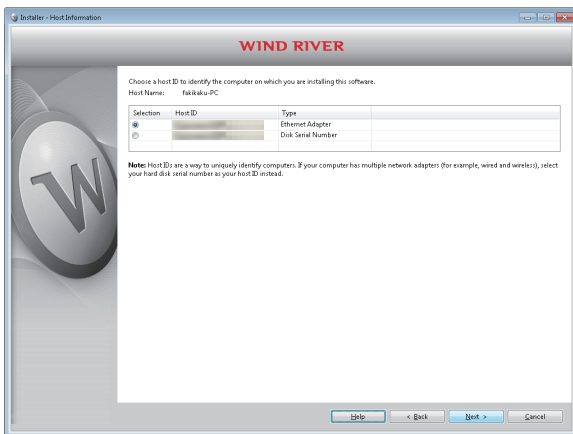
3

#### Point

- The screen shown below may appear after clicking the [OK] button in the step 2. Even if the [Cancel] button is clicked then also the operation will not cancel.



## Installation with a temporary license



1. Select "Temporary activation (requires License Authorization Code and Internet connection)" and click the [Next] button.

2. Check the content of "Note". Then, select either "Ethernet Adapter" or "Disk Serial Number" for "Host ID" and click the [Next] button.

3. Enter a License Authorization Code (LAC) and user information, click the [Next] button.

☞ Page 35 LAC and user information

4. Go to the following step 4.

☞ Page 30 Installation procedure

### Point

When selecting "Temporary activation (requires License Authorization Code and Internet connection)" an internet environment is required to acquire the Temporary activation. Execute the installation on a personal computer connected to the Internet. If the personal computer is connected to the Internet via a proxy server, configure the proxy server setting. (☞ Page 30 Installation procedure, step 4)

If "Temporary activation (requires License Authorization Code and Internet connection)" is selected without configuring the proxy server setting, installation does not proceed.



## ■ LAC and user information

Use alphanumeric characters for the LAC and user information.

Items with a \* mark on the window must be entered.

Item	Description
LAC	License Authorization Code (described in the License Agreement included with CW Workbench)
User Name	User name
Company	Company name
Address1	Address (such as town name and block number)
Address2	Building name, etc. (can be left blank)
E-mail	E-mail address
Phone	Phone number
Zip/Postal Code	Zip code
City	City
State/Province	State
Country	Country

## Installation using installation key file



1. Select "Permanent activation", and click the [Browse] button. Then, specify the installation key file (Install\_ARM.txt) file stored on the DVD-ROM.
2. Click the [Next] button.
3. Go to the following step 8.  
 ➞ Page 30 Installation procedure



If CW Workbench is installed by specifying the installation key file, it is installed with no license, and only the following functions can be used.

- Editor function (create, edit, save, search)
- Import/export

To use all the functions of CW Workbench, acquire and apply a permanent license.

➞ Page 27 Acquiring/Reacquiring Permanent License

➞ Page 37 Applying Permanent License

# Environment and operation after installation

The following explains the menus, sample programs, and others after CW Workbench and CW-Sim are installed.

## Menus to be registered

Once CW Workbench and CW-Sim are installed, [Wind River] is added on Windows® Start<sup>\*1</sup>, and the following menus can be selected.


\*1 Select [All apps] on the Start screen or [Start] ⇒ [All Programs].

Menu		Description
[CW Workbench 3.3]	[CW Workbench 3.3]	Starts CW Workbench.
	[Registry]	Starts Wind River Registry for Workbench 3.3. When CW Workbench is started, Wind River Registry for Workbench 3.3 also starts unless it has been running already. The icon is registered on the task tray.
	[CW Workbench Debug Mode 3.3]	Runs an already created project with debug mode CW Workbench.
[Documentation]	[All Installed Documents]	Brings up a help browser to display manuals provided by Wind River Systems, Inc.
	[VxWorks 6.9]	VxWorks 6.9 documents Wind River VxWorks Simulator User's Guide, 6.9 is registered only when CW-Sim has been installed.
[Product Maintenance]		Uninstalls and updates CW Workbench and applies a patch.
[VxWorks 6.9 and General Purpose Technologies]	[Accessing Documentation]	Opens the PDF describing the way to access the manuals provided by Wind River Systems, Inc.
	[FTP Server]	Starts WFTPD.
	[VxWorks COMx]	Starts HyperTerminal for Telnet connection. This menu cannot be used on the operating system, such as Windows® 7, where HyperTerminal is not installed.
	[VxWorks Development Shell]	Starts a command line Shell that can use the GNU compiler.

## Sample programs to be registered (CW Workbench)

When CW Workbench is installed on a personal computer, sample programs provided by Wind River Systems, Inc. are installed. To check the installed sample programs, start CW Workbench, and select [File]⇒[New]⇒[Example].

For details on the sample programs, refer to the Wind River Workbench document provided by Wind River Systems, Inc.

 CW Workbench menu [Help] ⇒ [Help Contents] ⇒ "Wind River Documentation" ⇒ "Workbench, 3.3" ⇒ "Wind River Workbench User's Guide, 3.3" ⇒ "Projects" ⇒ "Building and Debugging a Sample Project"

## Copying VxWorks image/symbol files (CW-Sim)

To use CW-Sim, copy the VxWorks image/symbol files stored in the "VxWorks" folder on the DVD-ROM to the local folder.

**Ex.**

Copy destination local folder


C:\CCPUSIM\vxWorks\_6\_9\_SMP

C:\CCPUSIM\vxWorks\_6\_9\_SMP.sym

## Registering to Exception List of Windows® Firewall (CW-Sim)

Before using CW-Sim, check the Windows® Firewall setting.

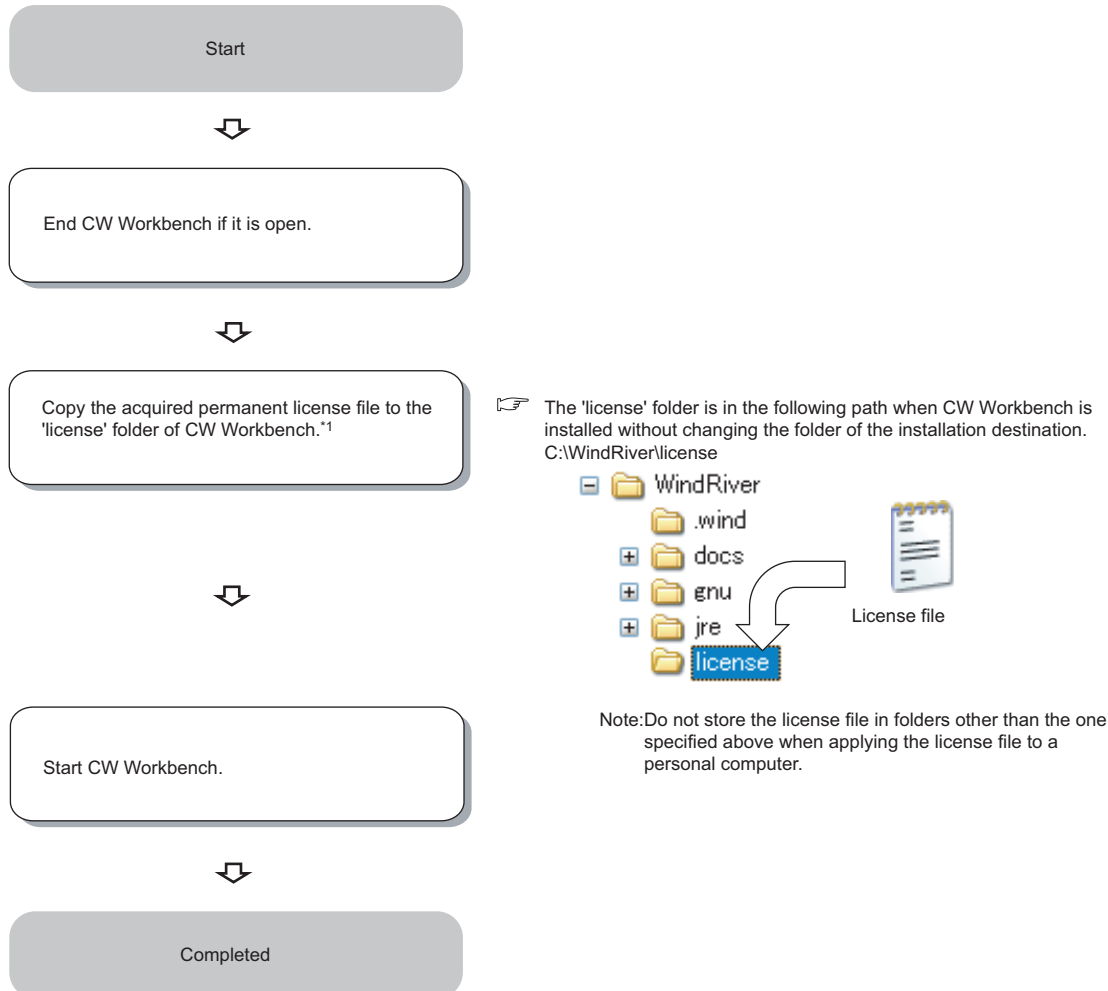
If Windows® Firewall is enabled, refer to the following section and check the settings.

 Page 111 Communication with the simulator cannot be established.

## 3.5 Applying Permanent License

Apply the acquired permanent license file to the personal computer on which CW Workbench and CW-Sim have been installed using a temporary license or an installation key file.

Apply it to the personal computer that was specified for 'Host Information' on the Permanent License Application Form by following the procedure below.



## 3.6 Applying Patch

This section explains how to apply a patch released for CW Workbench and CW-Sim. The procedure shown below with the screens are of Windows® 7, it may differ depending on the operating system.

### Point

- Log on as a user with administrative privileges when applying a patch to CW Workbench and CW-Sim.
- Terminate CW Workbench and CW-Sim before applying a patch.
- Do not stop the processing during patch application.
- When applying a patch on Windows® 7 or later, the confirmation dialog box of User Account Control appears. Click "Allow" or [Yes] button to continue the application of the patch.

# How to acquire patch

## Operating procedure

1. Obtain a patch file.

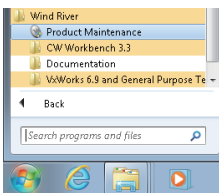
Please consult your local Mitsubishi representative to obtain a patch file.

2. Decompress the obtained file, and store it in the 'updates' folder under the installation destination folder of CW Workbench.

When the installation destination of CW Workbench is C:\WindRiver, the storage destination of the patch will be C:\WindRiver\updates.

# How to apply patch

## Operating procedure

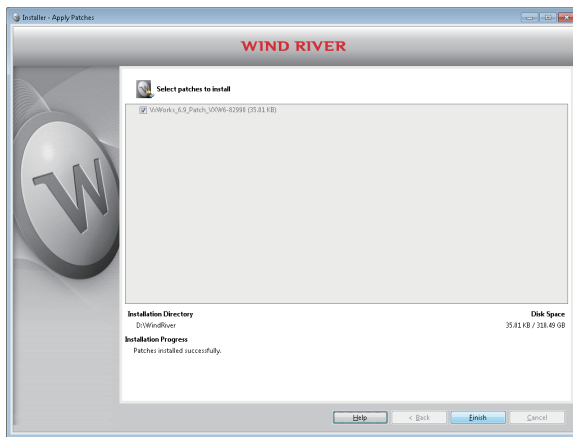


1. Select [Wind River] ⇒ [Product Maintenance] from Windows® Start\*1.

\*1 Select [All apps] on the Start screen or [Start] ⇒ [All Programs].

2. Select "Patch" and click the [Next] button.

3. Check that the patch to be installed has been selected, and click the [Install] button.



4. Click the [Finish] button.

3



If the patch to be installed is not displayed, check if the storage destination of the patch file is correct.  
Patch file storage destination: <Install folder of CW Workbench>\updates

# 4 INSTALLING CW-Sim Standalone

This chapter explains how to install CW-Sim Standalone.

For the considerations on installation, refer to the following section

☞ Page 26

## 4.1 Preparation for Installation

Before using CW-Sim Standalone, prepare the following items.

For preparation	Description
Development environment (personal computer)	<ul style="list-style-type: none"><li>• For information on the operating specifications of a personal computer, refer to the section for operating environment. (☞ Page 22 Operating Environment)</li><li>• Set the host name for the personal computer within 2 to 15 alphanumeric characters.</li></ul>
CW-Sim Standalone CD-ROM	<ul style="list-style-type: none"><li>• Prepare the CD-ROM included with the product with license (SW1DNC-CWSIMSAR-E).</li></ul>

## 4.2 Installation

The installer is not supplied with CW-Sim Standalone.

Copy "CWSIMSA" and "Samples" folders from the CD-ROM to the local folder.

**Ex.**

Copy destination local folder

C:\CCPUSIM



# 5 UNINSTALLING CW Workbench/CW-Sim

This chapter explains how to uninstall CW Workbench/CW-Sim.

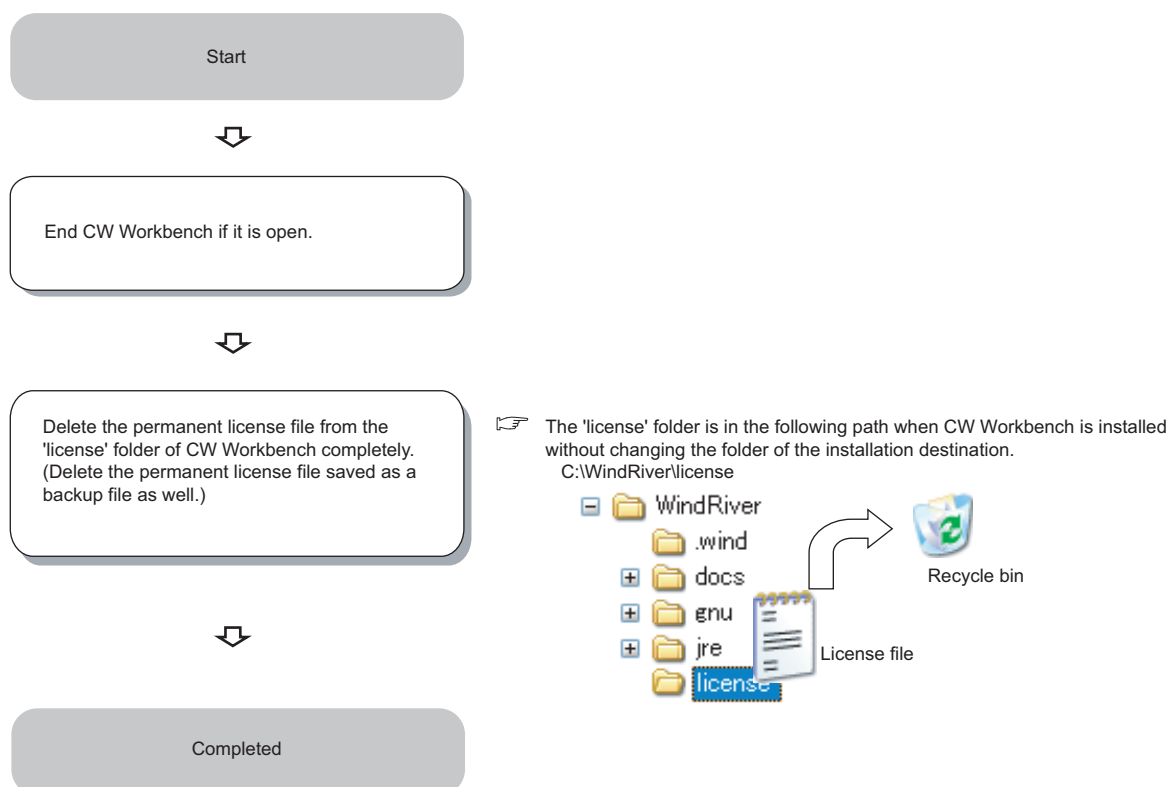
## 5.1 Preparation for Uninstallation

- Log on as a user with administrative privileges.
- Terminate CW Workbench before uninstalling.
- Uninstall the product in "Product Maintenance". The product cannot be uninstalled from [Add or Remove Programs]<sup>\*1</sup> in the Control Panel.
- Do not stop the uninstallation processing. If the processing has been stopped, uninstall the product again.  
If the uninstallation processing failed after the uninstallation processing has been stopped, reinstall the product and uninstall the product again. (☞ Page 107 Uninstallation process is cancelled in the halfway.)
- For uninstallation on Windows® 7 or later, the confirmation dialog box of User Account Control appears. Click "Allow" or [Yes] button to continue the uninstallation.

\*1 For Windows® 8, [Uninstall a program]

## 5.2 Deleting Permanent License

To delete the current permanent license for replacement of a host machine, delete it according to the following procedure.






## 5.3 Uninstallation

The following explains the uninstallation procedure and its method of CW Workbench. The procedure shown below with the screens are of Windows® 7, it may differ depending on the operating system.

Note that if CW Workbench is uninstalled, CW-Sim is uninstalled at the same time.

### Operating procedure

1. If the "Wind River Registry for Workbench 3.3" icon (  ) exists on the task tray of Windows®, right-click the icon and select "Shutdown" from the shortcut menu.

2. Click the [Yes] button when the message shown on the left is displayed.

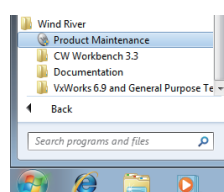
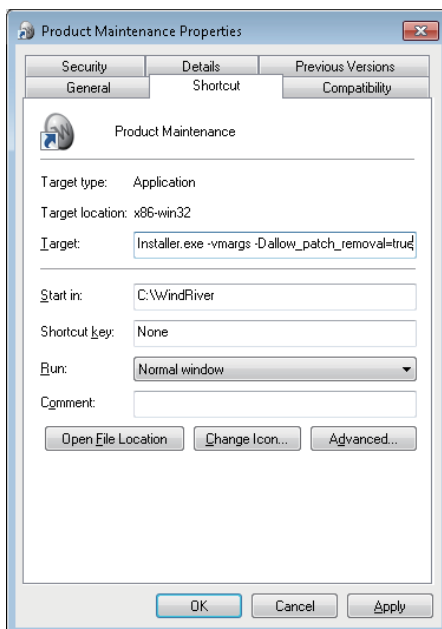
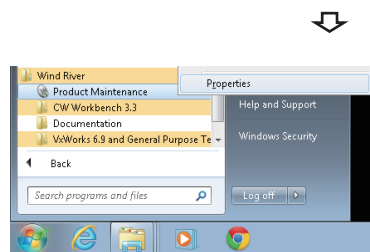
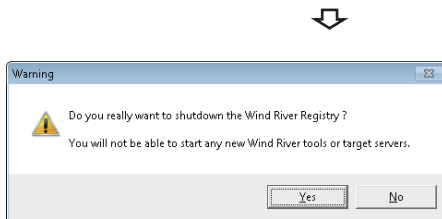
"Wind River Registry for Workbench 3.3" is shut down.

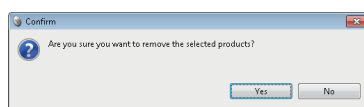
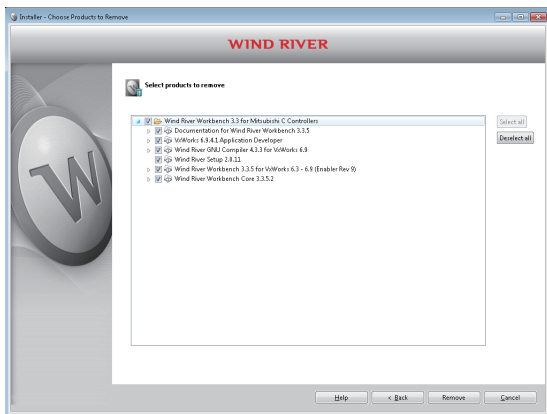
3. When a patch has not been applied, go to the step 6.

4. Select [Wind River] ⇒ [Product Maintenance] from Windows® Start\*1, and right-click and select "Properties" from the shortcut menu.

\*1 Select [All apps] on the Start screen or [Start] ⇒ [All Programs].

5. Add the following argument at the end of the "Target" field on the [Shortcut] tab, and click the [OK] button.  
[Argument] -vmargs -Dallow\_patch\_removal=true  
When a patch has been applied, the [Wind River] ⇒ [Product Maintenance] menu is not deleted.  
The menu is deleted by adding the argument above and uninstalling CW Workbench again.





**7.** Select "Remove" and click the [Next] button.  
CW Workbench/CW-Sim of this product is uninstalled. (The existing CW Workbench/CW-Sim is not uninstalled.)

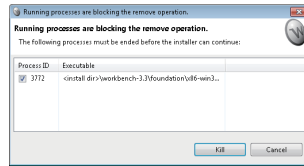
**8.** Check that items to be uninstalled have been selected, and click the [Remove] button.  
Uninstallation is started.  
If the argument is added in the step 5, select all the items including patch for uninstallation. Note that uninstallation of only patch may lead to improper operation.

The message shown on the left is displayed.

**9.** Click the [Yes] button.

**10.** Click the [Finish] button.

Click the [Kill] button if the screen shown below appears in the step 8.



## Environment after uninstallation

Even when CW Workbench and CW-Sim are uninstalled, some folders and files are not deleted.

Those folders and files are not deleted or removed as it will speed-up the installer startup during the re-installation of CW Workbench and CW-Sim.

The non removed folders and files can be deleted directly from explorer if those are not required.

- Data not to be deleted

Some files (folders) including Workspace folders and image files under the path of "<installation destination folder>".



# 6 UNINSTALLING CW-Sim Standalone

---

This chapter explains how to uninstall CW-Sim Standalone.

## 6.1 Uninstallation

---

CW-Sim Standalone does not have an uninstaller.

Delete all files copied to the local folder during installation.



# PART 3

# PROGRAMMING AND DEBUGGING

## PART 3

This part explains how to create programs and build projects, how to connect to C Controller module or CW-Sim, and how to debug programs.

7 CREATING AND BUILDING PROJECT

---

8 CONNECTING AND DEBUGGING C Controller module

---

9 CONNECTING CW-Sim AND DEBUGGING PROGRAMS

---

10 CONNECTING CW-Sim Standalone AND DEBUGGING PROGRAMS

---

11 USAGE EXAMPLE OF CW-Sim USING SAMPLE PROGRAM

---

# 7 CREATING AND BUILDING PROJECT

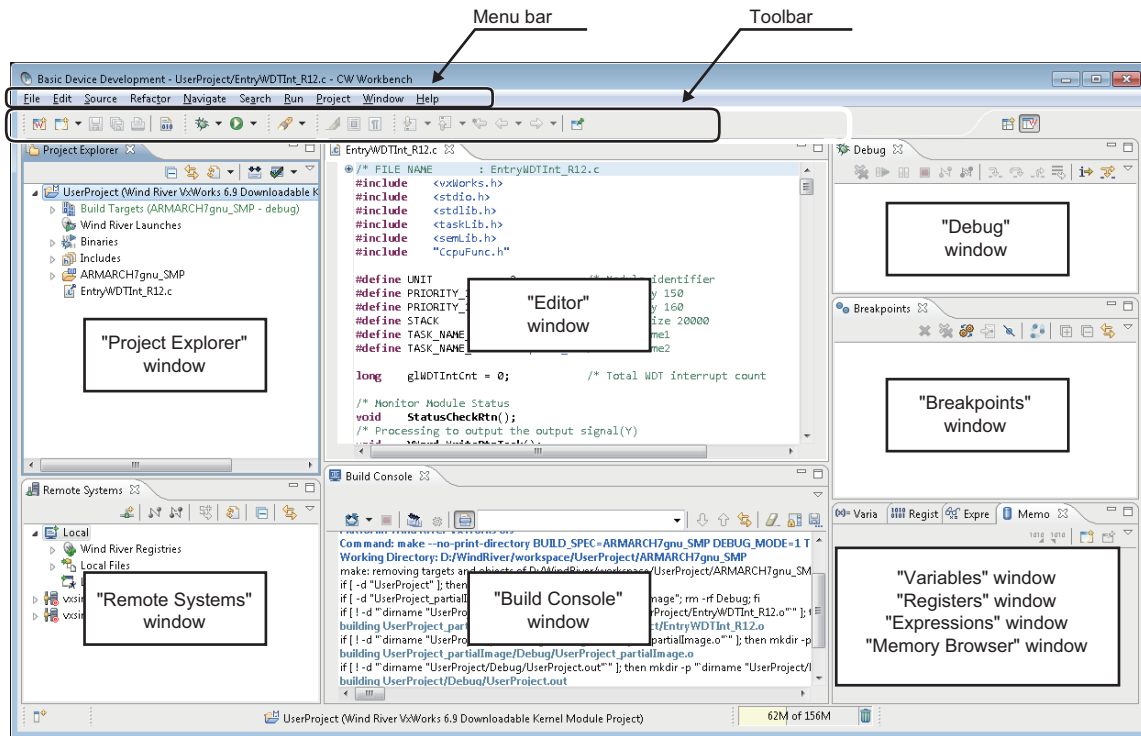
This chapter explains the project creation and building in CW Workbench.

## Screen configuration of CW Workbench

The following shows the screen configuration of CW Workbench.

The layout of the windows shown below is default status.

The layout of each window can be changed by dragging with the mouse.

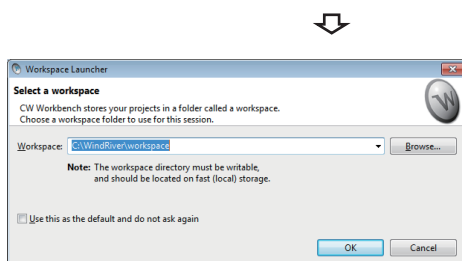


## 7.1 Creating New Projects

Create a new project.

### How to create a new project

#### Operating procedure



1. Select [Wind River] ⇒ [CW Workbench 3.3] ⇒ [CW Workbench 3.3] from Windows® Start\*<sup>1</sup>.

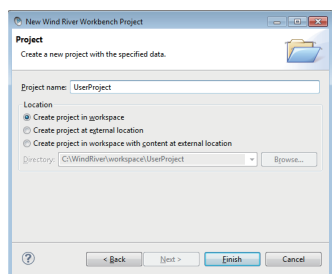
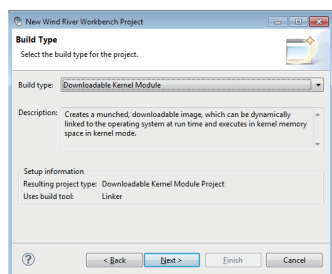
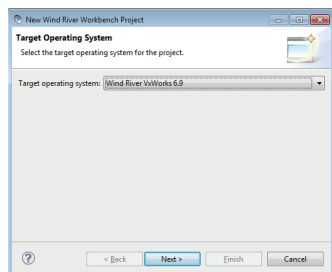
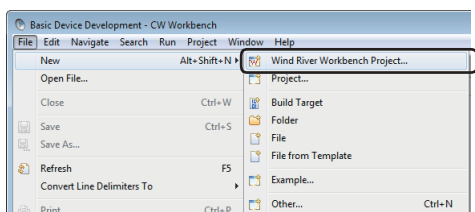
\*<sup>1</sup> Select [All apps] on the Start screen or [Start] ⇒ [All Programs].

The "Workspace Launcher" screen is displayed.

2. Enter a folder of save destination of workspace to "Workspace" and click the [OK] button.

A save destination can be also selected from the tree by clicking the [Browse] button.





CW Workbench is started.

3. Select [File] ⇒ [New] ⇒ [Wind River Workbench Project].

The "New Wind River Workbench Project" screen is displayed.

4. Select "Wind River VxWorks 6.9" for "Target operating system", and click the [Next] button.

5. Select "Downloadable Kernel Module" for "Build type", and click the [Next] button.

6. Enter a project name for "Project name", and click the [Finish] button.

The project is added to the "Project Explorer" window. If any of the following characters and symbols or a project name that is already used is entered for "Project name", an error text appears on the header of the window and the [Finish] button is disabled.

- ` , = , ! , # , \$ , % , ^ , \* , ( , ) , { , } , \ , | , ; , : , ' , " , . , < , > , / , ? , two-byte characters, katakana, or when a space is used except at the end of the project name

In addition, a space entered at the end of the project name is dropped.

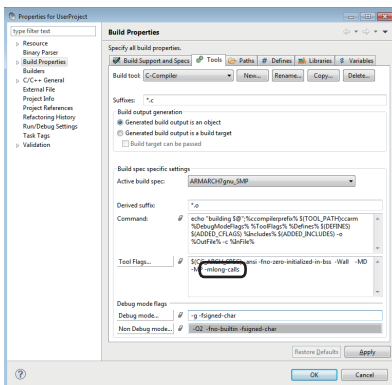
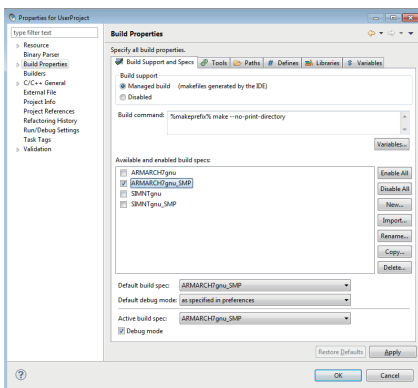
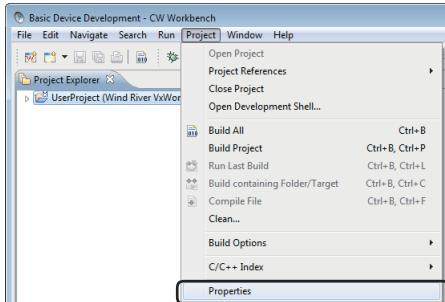


For the considerations when creating user programs, refer to the following manual.

MELSEC iQ-R C Controller Module User's Manual (Startup)

# How to set the property

## Operating procedure



1. Select a project to which property is to be set, and select [Project] ⇒ [Properties] on the "Project Explorer" window.

The "Properties for (project name)" screen is displayed.

2. Select "Build Properties" from the tree on the left on the screen, and select the [Build Support and Specs] tab.

3. Check that only the following item is selected in "Available and enabled build specs".

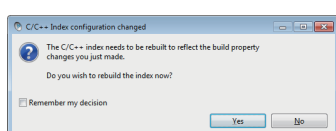
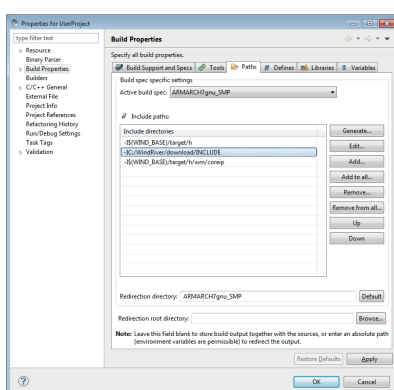
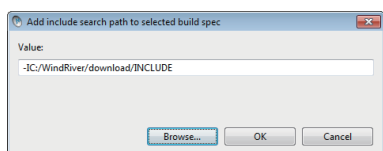
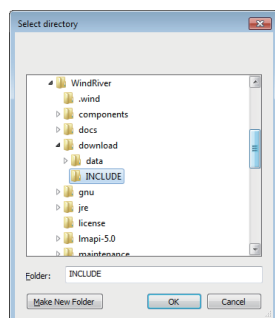
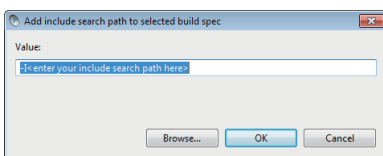
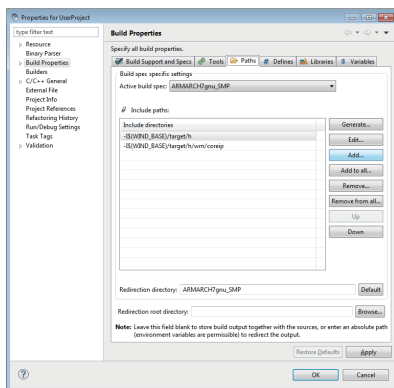
- For a project to be downloaded to C Controller module:  
"ARMARCH7gnu\_SMP"
- For a project to be simulated with CW-Sim or CW-Sim Standalone:  
"SIMNTgnu\_SMP"

The "Debug mode" is selected by default.

Unselect "Debug mode" for the practical operation (Non Debug mode).

4. Set the following for a project to be downloaded to C Controller module (that is, when "ARMARCH7gnu\_SMP" is selected in the step 3):

- Select the [Tools] tab, enter "-mlong-calls" in the box next to the [Tool Flags] button.
- Enter "-fsigned-char" in the boxes next to the [Debug mode] and [Non Debug mode] buttons for "Debug mode flags".



5. Select the [Paths] tab, and click the [Add] button.

The "Add include search path to selected build spec" screen is displayed.

6. Click the [Browse] button.

The "Select directory" screen is displayed.

7. Select the include folder to be added, and click the [OK] button.

The include file is stored in the following.

Use the include file after copying it to a local folder of the personal computer.

- R12CCPU-V: /SYSTEMROM/INCLUDE
- CW Workbench/CW-Sim DVD-ROM: \Include

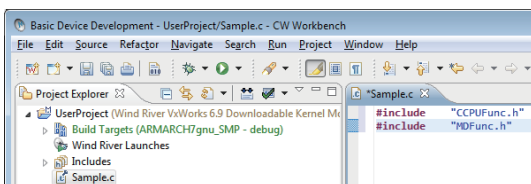
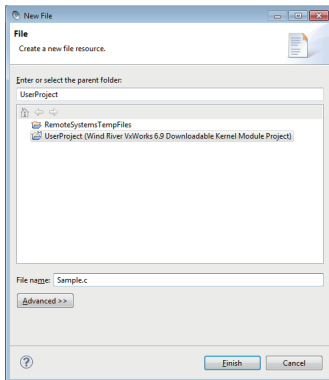
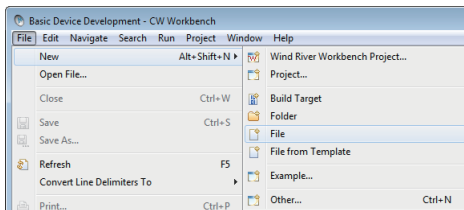
8. Check that the include folder specified in the step 6 is selected, and click the [OK] button.

9. Check that the added include folder is displayed in the "Include directories" column in "Include paths", and click the [OK] button.

10. If the message shown on the left appears, click the [Yes] button.

# How to add new files

## Operating procedure



1. Select a project to which a new file is to be added from the "Project Explorer" window, and select [File] ⇒ [New] ⇒ [File].

"New File" is displayed.

2. Enter a file name in "File name", and click the [Finish] button.

Enter a file name with extension (.c, .h, .cpp, .hpp) for "File name:"

3. Edit the source files on the "Editor" window and include the following include file:

C Controller module dedicated function: "CCPUFunc.h"

MELSEC data link function: "MDFunc.h"

## Point

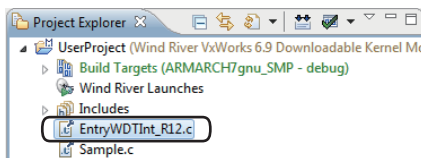
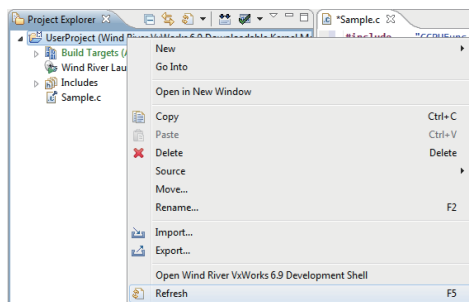
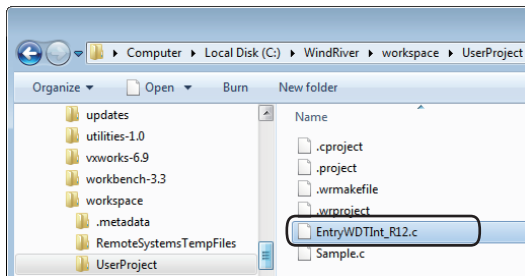
- If characters that cannot be used for Windows® is entered for "File name", an error text appears on the header of the window and the [Finish] button is disabled.
- Do not use the following characters and symbols for "File name". Otherwise, a compilation error occurs at compilation.

#, \$, &, ' , ( , ) , : , = , ` , two-byte characters, katakana

☞ Page 106 Common Troubleshooting

# How to add source files

## Operating procedure



1. Copy the created source file to the current folder of the project to be added on the explorer.

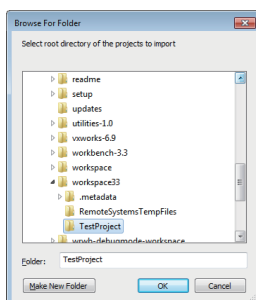
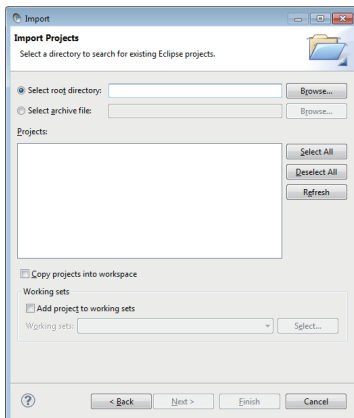
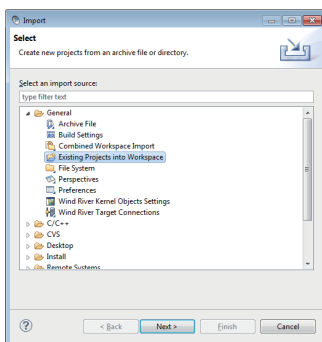
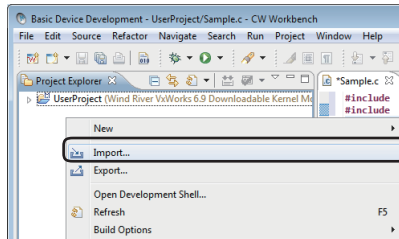
2. Select the project to which the source file is to be added from the "Project Explorer" window, and right-click ⇒ [Refresh] from the shortcut menu.

The source file copied in the step 1 is added to the project.

## 7.2 Adding Projects

In CW Workbench, multiple projects can be managed on the same workspace by adding other projects following the instruction below.

### Operating procedure



1. Right-click on the "Project Explorer" window and select [Import] from the shortcut menu.

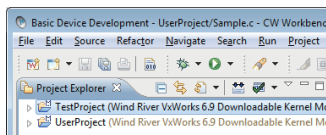
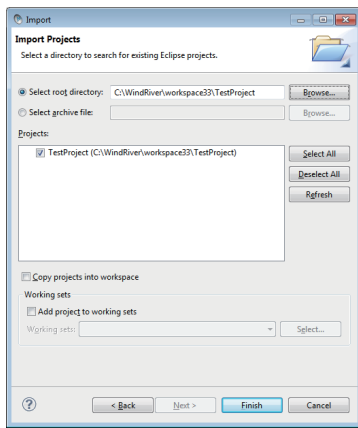
The "Import" screen is displayed.

2. Select "General" ⇒ "Existing Projects into Workspace", and click the [Next] button.

3. Select "Select root directory" and click the [Browse] button.

The "Browse For Folder" screen is displayed.

4. Select the folder in which the project to be imported is stored, and click the [OK] button.



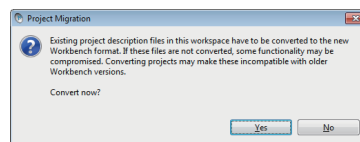
A list of the projects stored in the folder (including subfolders) specified in "Select root directory" is displayed in "Projects".

5. Check that the project to be imported is selected, and click the [Finish] button.

The specified project is imported to the workspace.



When importing a project created in Wind River Workbench 2.6 or earlier, the following message appears. Click the [Yes] button.

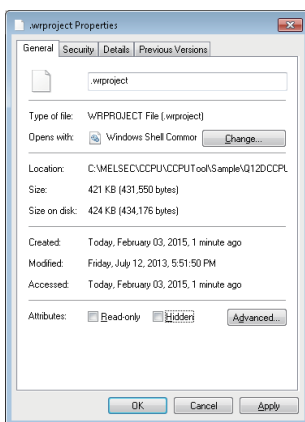
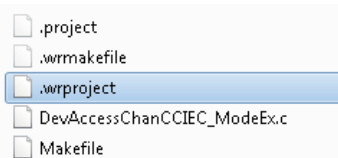
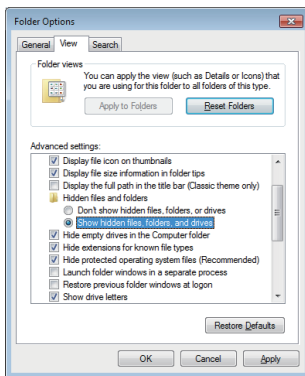


## Importing projects created in the existing CW Workbench

### Operating procedure

**1.** Select any of the following:

- For Windows® 8 or later  
[All apps] ⇒ [Control Panel] ⇒ "Appearance and Personalization" ⇒ "Folder Options" on the Start screen of Windows®
- For Windows® 7  
[Control Panel] ⇒ "Appearance and Personalization" ⇒ "Folder Options" from the Start menu of Windows®
- For Windows® XP  
[Control Panel] ⇒ "Appearance and Themes" ⇒ "Folder Options" from the Start menu of Windows®



The "Folder Options" screen is displayed.

**2.** Select "Show hidden files, folders, and drives" in the [View] tab under "Hidden files and folders" in "Files and Folders", and click the [OK] button.

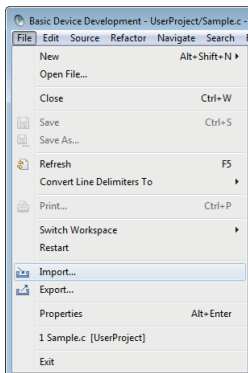
**3.** Select the '.wrproject' file in the import target project folder on the explorer. Right-click and select [Property] from the shortcut menu.

The ".wrproject Properties" screen is displayed.

**4.** Unselect "Hidden" and click the [OK] button.

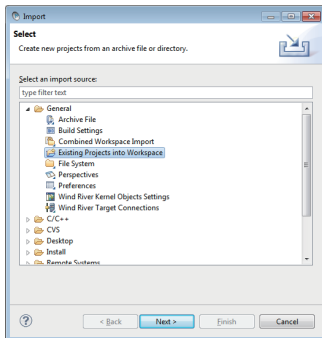


5. Select [File] ⇒ [Import] in CW Workbench.

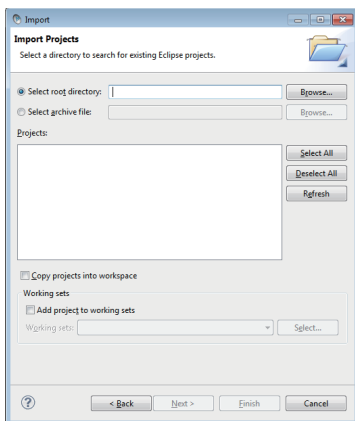


The "Import" screen is displayed.

6. Select "General" ⇒ "Existing Projects into Workspace", and click the [Next] button.

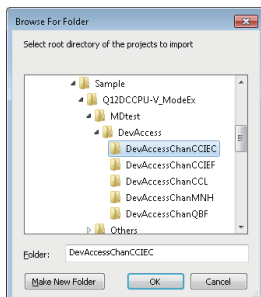


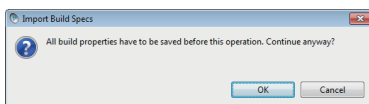
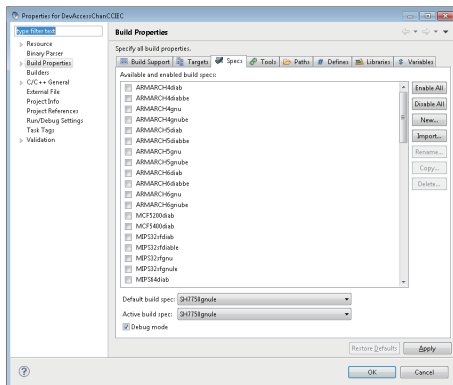
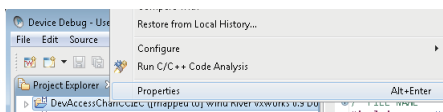
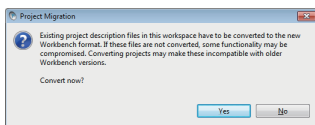
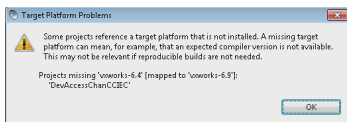
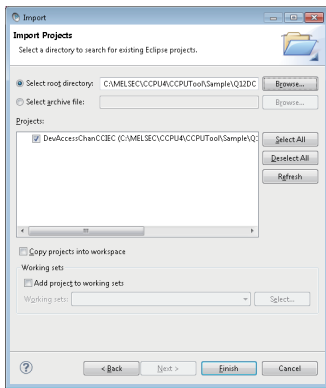
7. Select "Select root directory" and click the [Browse] button.



The "Browse For Folder" screen is displayed.

8. Select the folder in which the project to be imported is stored, and click the [OK] button.





A list of the projects stored in the folder (including subfolders) specified in "Select root directory" is displayed in "Projects".

**9.** Check that the project to be imported is selected, and click the [Finish] button.

**10.** If the message shown on the left appears, click the [OK] button.

The message shown on the left is displayed.

**11.** Click the [Yes] button.

**12.** Select the imported project, and select [Project] ⇒ [Properties].

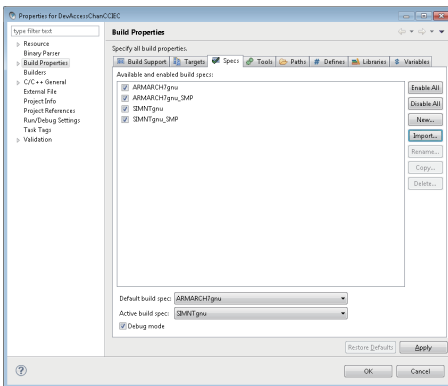
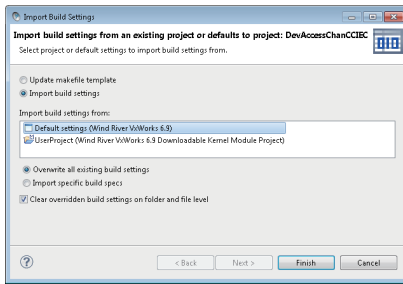
The "Properties for (project name)" screen is displayed.

**13.** Select "Build Properties" from the tree on the left on the screen, and select the [Build Support and Specs] tab or the [Specs] tab.

**14.** Click the [Import] button of "Available and enabled build specs".

The message shown on the left is displayed.

**15.** Click the [OK] button.



The "Import Build Settings" screen is displayed.


**16.** Select "Default settings (Wind River VxWorks 6.9)" and click the [Finish] button.

**17.** Click the [Disable All] button.

**18.** Select "ARMARCH7gnu\_SMP" and click the [OK] button.

The import of the project created in the existing CW Workbench is completed.

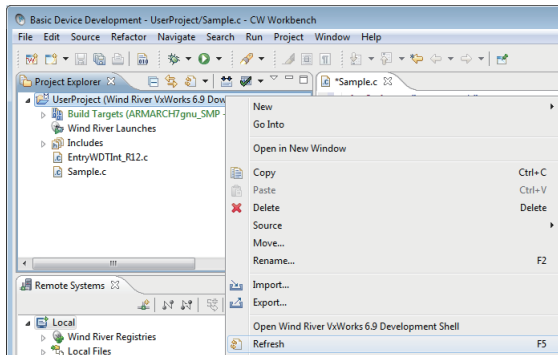
Set the property as necessary.

 Page 52 How to set the property

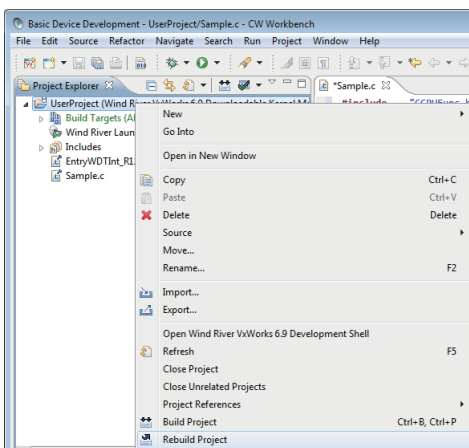
## 7.3 Building Project

Build a project.

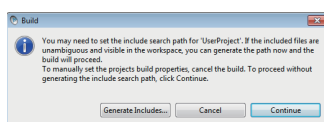
### Operating procedure



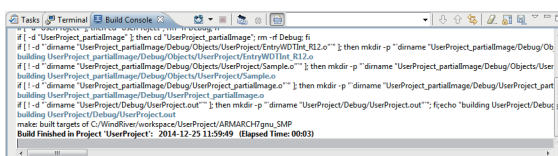
1. Select the project name to be built on the "Project Explorer" window, and right-click ⇒ [Refresh] from the shortcut menu.



2. Select the project name to be built on the "Project Explorer" window, and right-click ⇒ [Rebuild Project] from the shortcut menu.

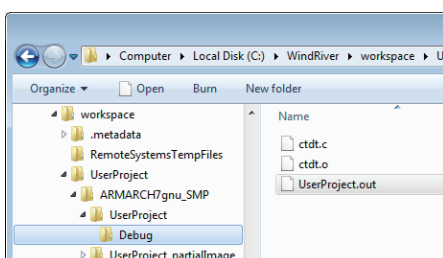


3. If the message shown on the left appears, click the [Continue] button.



The build process is displayed on the "Build Console" window.

Once the build is completed, "Build Finished ..." is displayed. Check if there is an error information (red) on the "Build Console" window.



After the build is completed, execution file (user program) to be used in a C Controller module is created.

A file name of the user program is "(project name).out".

If an error occurs during the build, a user program is not created.

Folders when a user program is to be created after the build is completed normally are as follows:

- In Debug mode:

(Workspace folder)\(Project name folder)\ARMARCH7gnu\_SMP\Project name folder\Debug

- In Non Debug mode:

(Workspace folder)\(Project name folder)\ARMARCH7gnu\_SMP\Project name folder\NonDebug

When a user program is created on the imported project, the folders above may differ depending on the configurations of folders and projects in which the imported project exists.

Check the folders in which a user program is created on the imported project.

## Precautions

### ■If the build result has an error

Error information (source file name, line number, and error details) is displayed in red on the "Build Console" window.

Double-click the column in which source file name and line number are displayed in red to jump to the corresponding error location in the source file.

Modify and rebuild source codes until all the error information (red) is cleared.

### ■If an error "command not found" occurs

Unsupported compiler may be used.

Check that "ARMARCH7gnu\_SMP" is selected in the [Build Support and Specs] tab of "Build Properties".

Do not select the items other than "ARMARCH7gnu\_SMP".

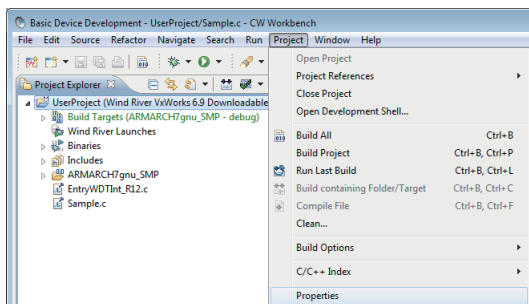
# Setting optimization option

The following describes how to set an optimization option that prioritizes the processing speed.

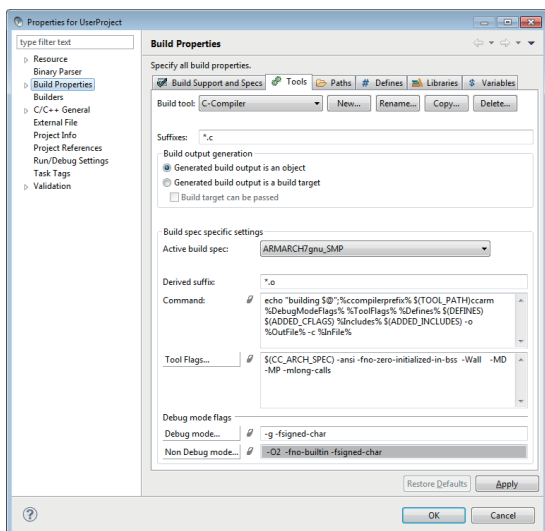
## Restriction

Set an optimization option when using in Non Debug mode. Using in Debug mode may result in improper debugging.

## Operating procedure

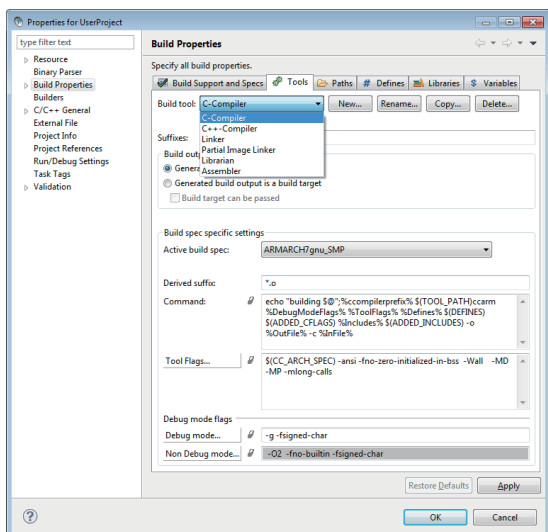


1. Select a project to which the optimization option is to be set, and select [Project] ⇒ [Properties].



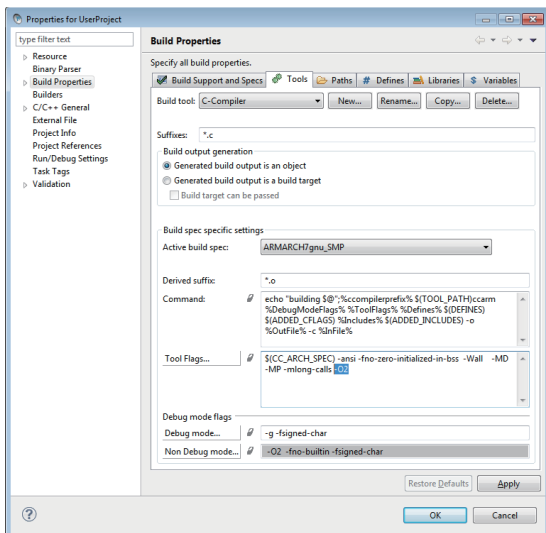
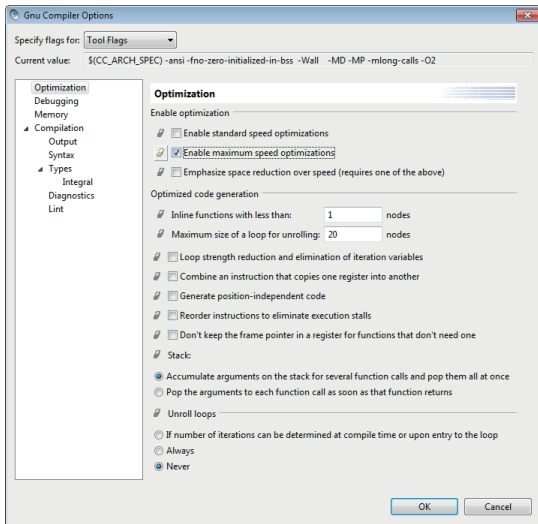
The "Properties for (project name)" screen is displayed.

2. Select "Build Properties" from the tree on the left on the screen, and click the [Tools] tab.



3. Select "C-Compiler" from "Build tool", and click the [Tool Flags] button.

For C++, select "C++-Compiler".



The "Gnu Compiler Options" screen is displayed.



4. Select "Optimization" from the tree on the left on the screen, and select "Enable maximum speed optimizations".

5. Check that "-O2" has been added to "Current value", and click the [OK] button.

6. Check that "-O2" is added in the box next to the [Tool Flags] button in "Build Properties", and click the [OK] button.

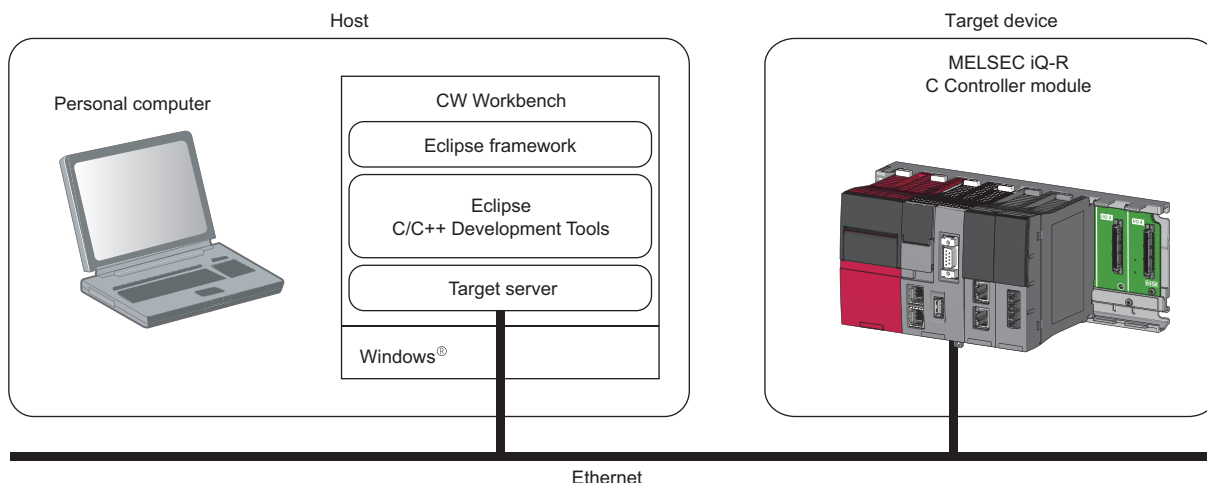
7

### Point

To cancel the optimization option, select "Optimization" from the tree on the left on the "Gnu Compiler Options" screen. Then, click the button (  ) in "Enable optimization", or unselect the check box. Check that the button is changed to cancel (  ) and "-O2" is deleted from "Current value".

# 8 CONNECTING AND DEBUGGING C Controller module

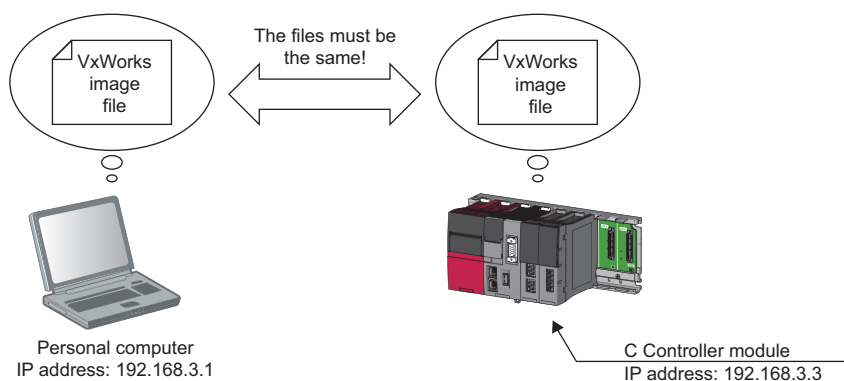
This chapter explains the settings of target server to establish communication between the host (target server) and target (C Controller module), connect/disconnect communication, and procedure for debugging.



## 8.1 Setting Target Server

The following settings are required for CW Workbench to establish connection between target server and C Controller module.

- Setting an IP address for C Controller module
- Setting a VxWorks image file



### Point

The VxWorks image file which is to be set to CW Workbench and the VxWorks image file in the system memory (/SYSTEMROM/OS\_IMAGEFILE) of C Controller module must be matched.

If VxWorks image file does not exist in the personal computer or VxWorks image files are not matched, acquire the VxWorks image file from C Controller module and set it to CW Workbench.



## Checking method of VxWorks image file consistency


Check that the file name of VxWorks image file stored in C Controller module is the same as that of the VxWorks image file which is to be set to CW Workbench.

For R12CCPU-V:

/SYSTEMROM/OS\_IMAGEFILE/R12CCPU-V\_XX<sup>\*1</sup>

\*1 "XX" indicates the upper two digits of the product information (16 digits) of C Controller module.

For the checking methods on the product information (16 digits), refer to the following manual.

 MELSEC iQ-R C Controller Module User's Manual (Startup)

## Acquiring method of VxWorks image file

Copy a VxWorks image file on the C Controller module to an arbitrary folder on the personal computer using FTP.

Do not copy the VxWorks image file to a path or a folder that uses two-byte characters and katakana.

A VxWorks image file of C Controller module is stored in "/SYSTEMROM/OS\_IMAGEFILE".

The default user name and password to connect to C Controller module using FTP are as follows:

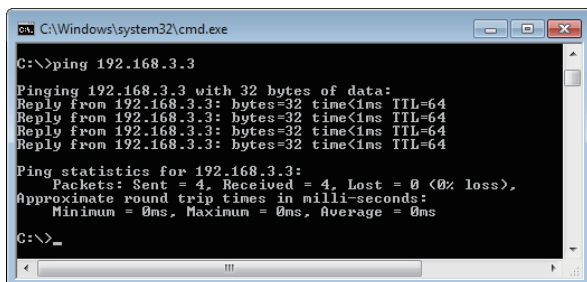
- User name: target
- Password: password

If the default user name and password have been changed, use the user name and password before the change.

## Checking network connection

Check that the C Controller module, which is a connection destination of the target server, is connected to the personal computer using a ping command.

### Operating procedure



1. Select [All Programs] ⇒ [Accessory]<sup>\*1</sup> ⇒ [Command Prompt] from Windows® Start.

\*1 For Windows® 8, select [All apps] on the Start screen.  
A command prompt is started.

2. Execute the ping command and check that the C Controller module is connected to the network.

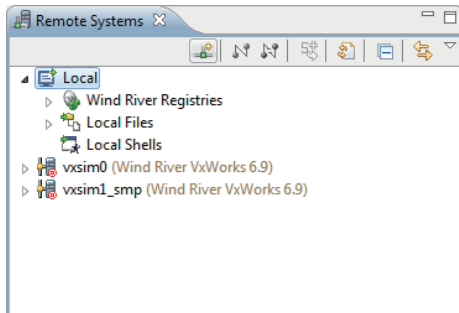
Specify the IP address of the C Controller module for the argument of ping command.


The default IP address of a C Controller module is 192.168.3.3.

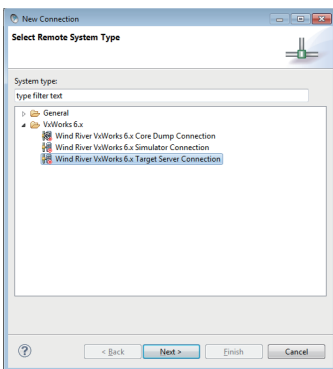
3. Execute an exit command and end the command prompt.

# How to set the target server connection

## Operating procedure

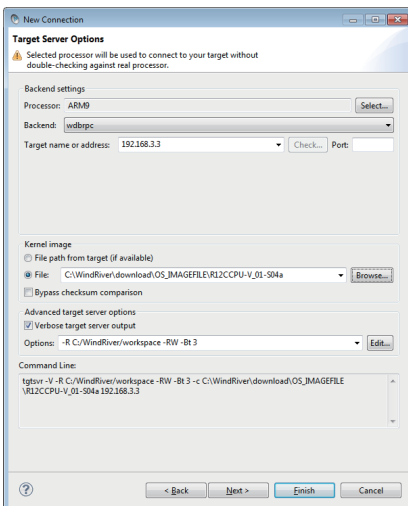


1. Click  on the toolbar of "Remote Systems" window.



"New Connection" screen is displayed.

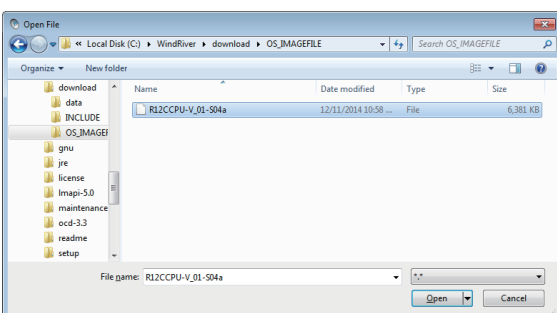
2. Select "Wind River VxWorks 6.x Target Server Connection" and click the [Next] button.



3. Set the target connection information.

- Processor: ARM9
- Backend: wdbrcp
- Target name or address: 192.168.3.3 (default)
- Port: Blank

4. Select "File" in "Kernel image" and click the [Browse] button.



"Open File" screen is displayed.

5. Select the VxWorks image file and click the [Open] button.



Specify the corresponding VxWorks image file as C Controller module.

6. Click the [Finish] button.

The connection with the C Controller module is started.

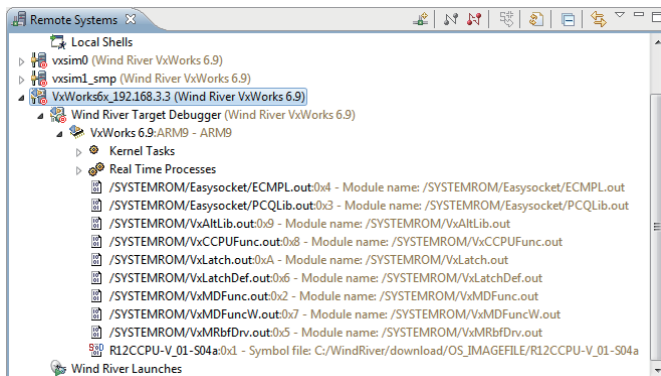
## 8.2 Connecting and Disconnecting Communication

After setting the target server, connect/disconnect the communication with C Controller module with any of the following operations.

- Select the added target server and click  .
- Select the added target server, and right-click and select [Connect]/[Disconnect] from the shortcut menu.

After the server is connected to C Controller module successfully at "Connect", "Connected - Target server running" is displayed at the bottom of the main window.

After the target server is disconnected from C Controller module successfully at "Disconnect", "Unconnected" is displayed at the bottom of the main window.



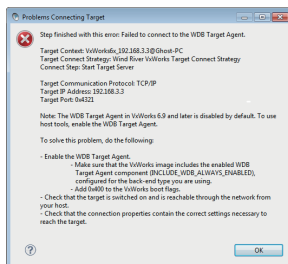
### Precautions

#### ■Connection state of C Controller module

Even if the C Controller module is powered OFF, the connection is not disconnected without executing "Disconnect". The C Controller module is connected to the target server automatically when the C Controller module is powered ON again.

#### ■An error occurs at "Connect"

The following error message appears if the C Controller module is not running or if the network is not connected with the target server.




If the error shown above occurs, check the following:

- The C Controller module is powered ON and is running properly.
- The target server can be connected to the C Controller module.

### Point

Select the connected target server to use the Host Shell.

For how to start the Shell, refer to the following section.

 Page 71 Starting Shell

For details on Shell, select the following menu.

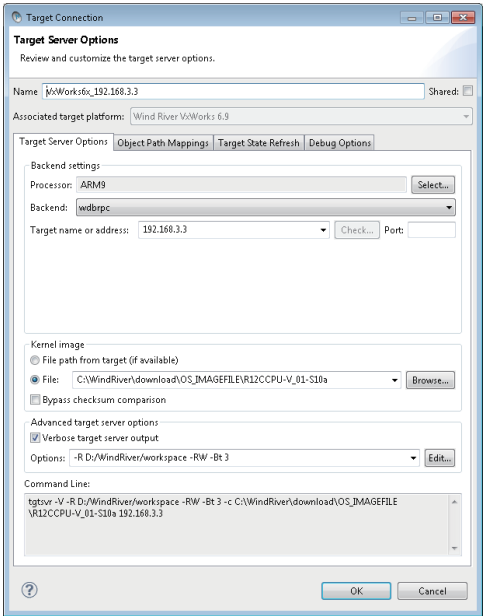
[Help] ⇒ [Help Contents] ⇒ "Wind River Documentation" ⇒ "Workbench, 3.3" ⇒ "Wind River Workbench Host Shell User's Guide, 3.3"

# How to check connection settings

If the target server cannot be connected to the C Controller module, follow the instructions below to check and change the connection setting.

## Window

Select the target server on the "Remote Systems" window. Right-click and select [Properties] from the shortcut menu.



Check that the settings are configured as shown in the following table.

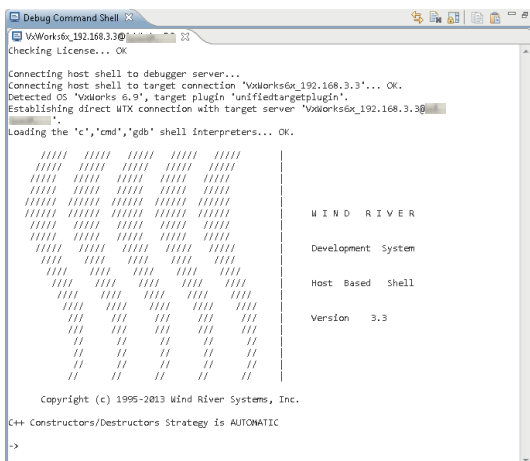
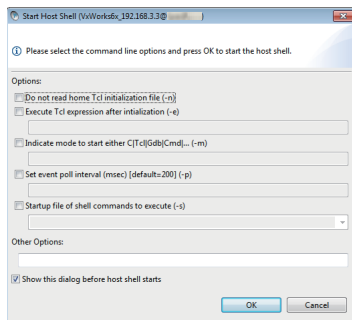
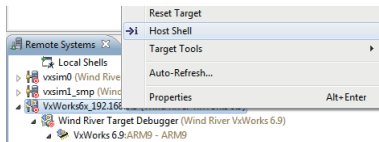
Item	Connection information
Processor	ARM9
Backend	wdbRPC
Target name or address	192.168.3.3 (If the IP address of the C Controller module is default)
Kernel image	Set the VxWorks image file in "File".

Do not change the "Advanced target server options" setting.

## 8.3 Starting Shell

Start up a Shell from the target server connected to C Controller module.

### Operating procedure



1. Select the target server connected to the C Controller module on the "Remote Systems" window. Right-click and select [Host Shell] from the shortcut menu.

"Start Host Shell" screen is displayed.

2. Click the [OK] button.

The "Debug Command Shell" window is displayed, and the Shell starts.

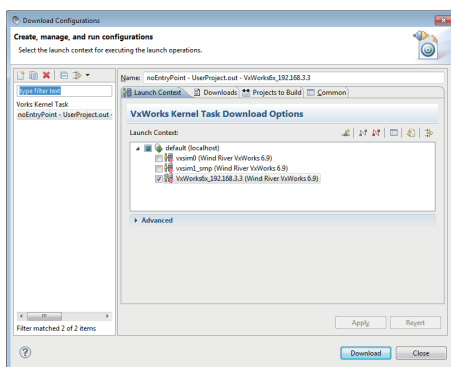
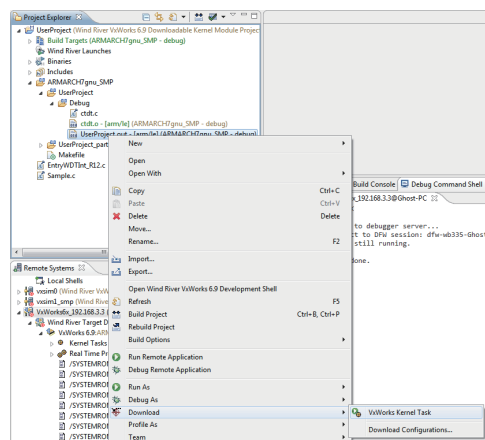
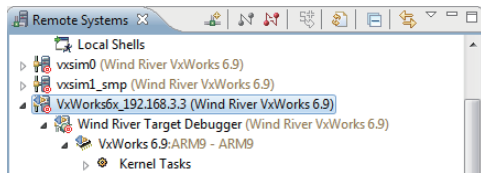
## 8.4 Downloading Module for Debugging

Download an execution file (.out) onto the C Controller module.

Downloading a module for debugging means to download an execution file (user program) onto the memory of C Controller module.

The downloaded execution file is used for activating a task from Shell.

### Operating procedure



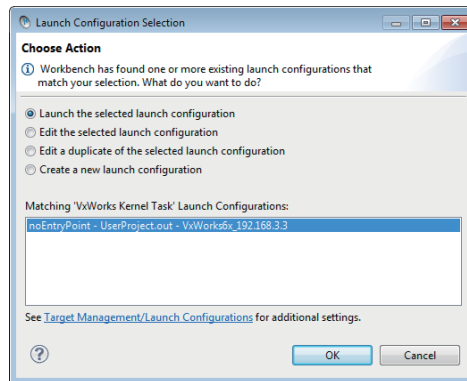
1. On the "Remote Systems" window, select the target server in which the execution file is to be downloaded. Select the target server connected to the C Controller module for the target server.

2. Select the execution file to be downloaded from the "Project Explorer" window. Right-click and select [Download] ⇒ [VxWorks Kernel Task] from the shortcut menu.

"Download Configurations" screen is displayed.

3. Click the [Download] button.  
The selected execution file is downloaded on the C Controller module.

The following screen is displayed during or after the second operation.  
Select the starting method (Launch configuration) and click the [OK] button.



## 8.5 Debugging User Programs

This section shows how to debug a user program of C Controller module. As an example, sample program 'EntryWDTInt\_R12.c' is used.

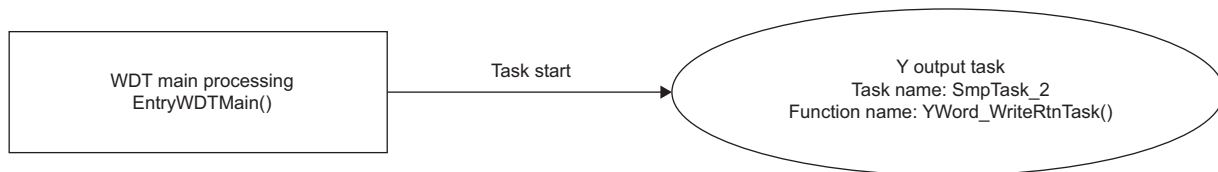
### Point

For details on sample programs, please consult your local Mitsubishi representative.

### Precautions

To debug on CW Workbench, it is necessary to build the execution module in the Debug mode.

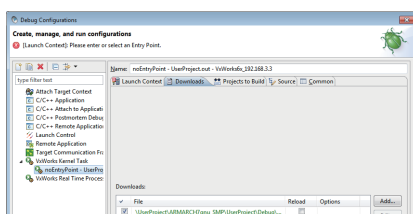
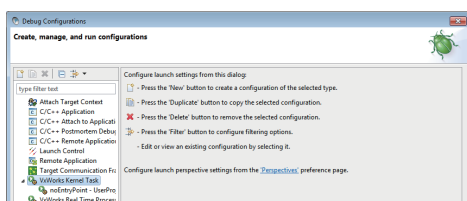
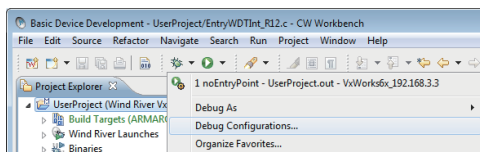
Page 52 How to set the property




## Debugging of single task

The following describes the procedure from downloading the target file up to debugging on C Controller module. Connect the C Controller module and CW Workbench before debugging a task.

### Operating procedure



1. On the "Project Explorer" window, select a project to be debugged. Select [Debug Configurations] in the pull-down list of  on the toolbar.

"Debug Configurations" screen is displayed.

2. Double-click "VxWorks Kernel Task" in the tree on the left on the screen.

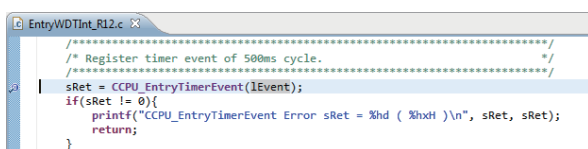
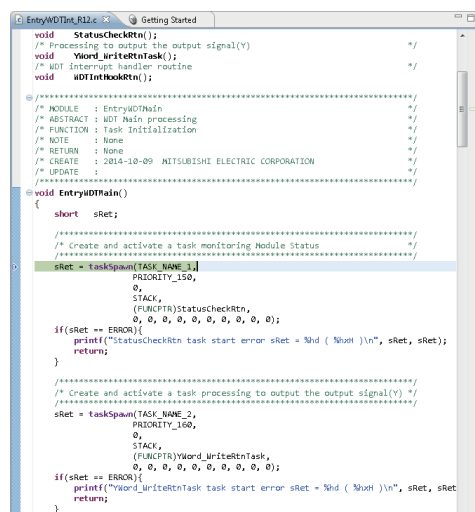
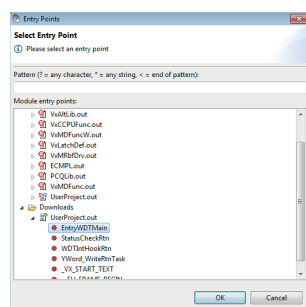
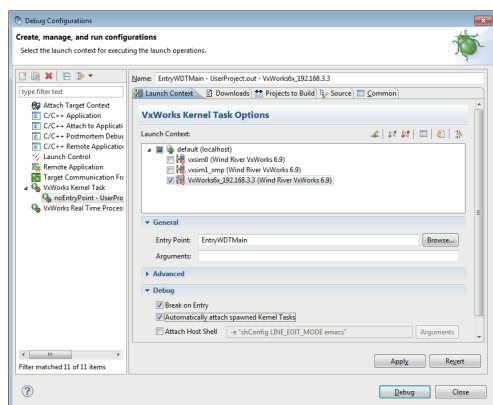
A new debug configuration is created under "VxWorks Kernel Task".

3. Select the created debug configuration and check the '.out' file to be downloaded in the [Downloads] tab.

The '.out' file of the project which is selected in the step 1 has been registered.

If the '.out' file is not registered, click the [Add] button and specify the '.out' file to be downloaded.





4. Check that the target server connected to the debugging target C Controller module is selected in the [Launch Context] tab, and click the [Browse] button.

The "Entry Points" screen is displayed.

5. Select the function to start debugging from "Module entry points", and click the [OK] button.

The function can be selected from the '.out' file specified in the [Downloads] tab.

To debug a task created (taskSpawn) from a function specified to "Entry Point", selecting "Automatically attach spawned Kernel Tasks" is required.

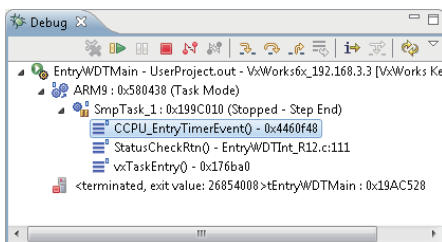
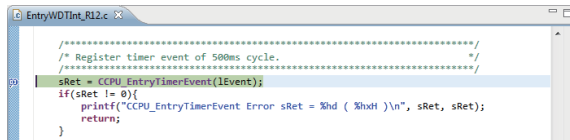
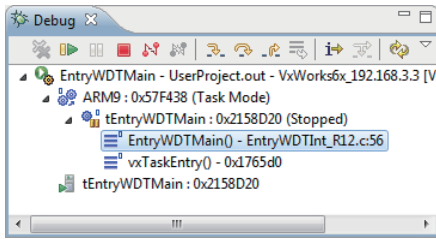
- 6.** Click the [Debug] button.

Debugging is started.

Initially, the status of debugging will be 'Suspended status (during suspension)' at the start of the function specified to "Entry Point".

7. Double-click the breakpoint on a line (■) where a task operation is to be suspended.




A breakpoint is inserted.




8. Click .

The task operation is restarted.

The task operation is suspended at the position of the breakpoint inserted in the step 7.


9. Check the operation of the task by using , , or .

 Page 77 Debug operation

10. After checking the task operation, click  on the "Debug" window.




The debugging is completed.










### Point

To debug the task again, select the created debug configurations in the pull-down list of  on the toolbar. The steps from 1 to 6 can be skipped.

## Task operation status




The following table shows the status of the task operations based on enabled or disabled status of the three buttons:

 (Resume),  (Suspend), and  (Terminate).

Button state	Task operation state
  	Run status (during execution)
  	Suspended status (during suspension)
  	Termination status (debugging terminated)

## Debug operation

The tool buttons used for the debugging operations are as follows:

Button	Description
	Step Into Performs debugging in one step units. For the function steps, step execution is continued with into the called function.
	Step Over Performs debugging in one step units. For the function steps, step execution is continued in function units without into the called function.
	Step Return Continues execution at the end of the function in which the current step exists.

## Windows used for debugging

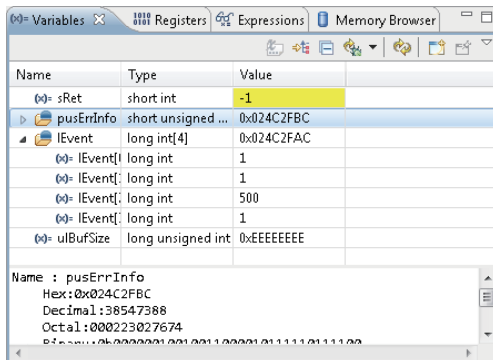
By checking and changing the values using the window below at Suspend status, debugging can be performed efficiently.

The color of a cell is displayed in yellow if the value has been changed from the previous value by step execution. At the

"Memory Browser" window, the color of value is displayed in green.

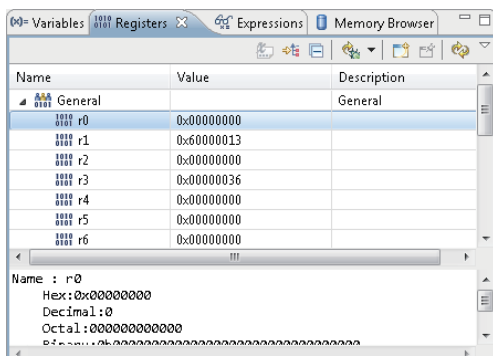
### ■ "Variables" window

Displays the current values of local variables.



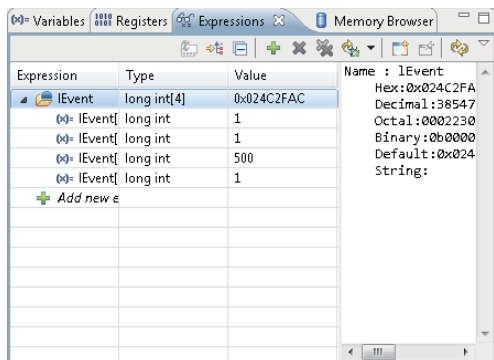
### ■ "Registers" window

Displays the current values of registers.



## ■"Expressions" window

Displays the current values of variables registered on the Watch window.

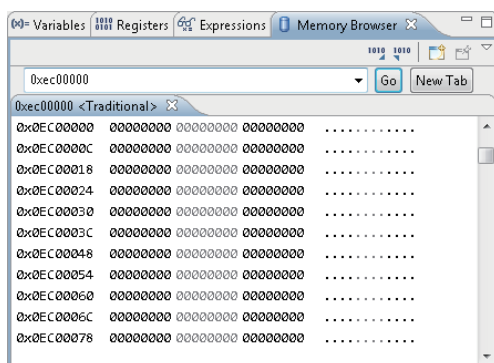


## ■"Memory Browser" window

Displays the memory dumps on the C Controller module.

Timing to refresh values can be selected.

Right-click on the [Memory Browser] tab and select [Update Mode]⇒[Always]/[On Breakpoint]/[Manual] from the shortcut menu.



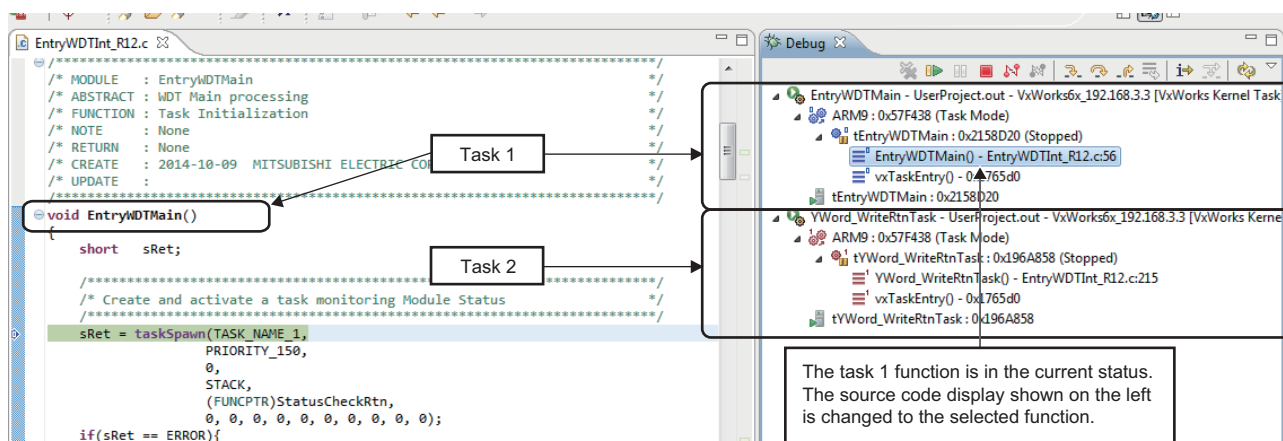
# Debugging of multiple tasks

## Operating procedure

1. Repeat the procedure from the step 1 to step 6 described in "Debugging of single task". (Page 74 Debugging of single task)

Multiple tasks can be started.

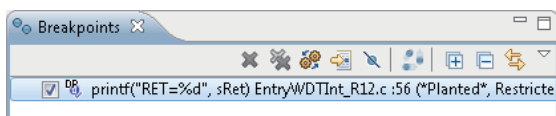
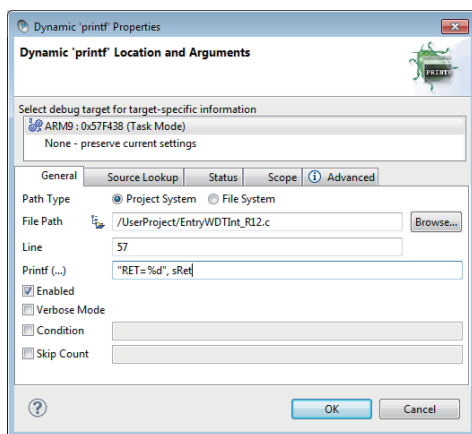
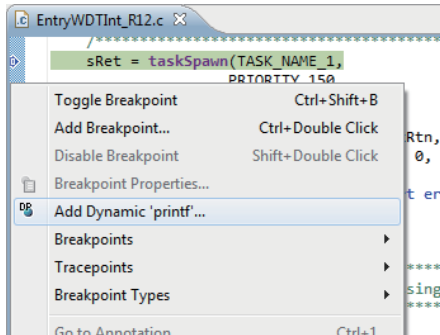
- The executed task is displayed on the "Debug" window.
  - The tasks can be switched by selecting a function on the "Debug" window.
- Multiple tasks can be debugged with switching the tasks.



# Dynamic Printf

This function is used to insert or cancel the printf statement dynamically during debugging of program, there is no need to add printf function to the source code and the operation is similar to that of the breakpoint.

## Operating procedure



1. Open the source file to be debug in the "Editor" window.
2. Select the left edge part (█). Right-click and select [Add Dynamic 'printf'] from the shortcut menu.

"Dynamic 'printf' Properties" screen is displayed.

3. Enter the statement to be displayed during debugging the program at "Printf(...)". It has the same text format as the argument to be written in the printf function. Click the [OK] button.

The print statement entered at "Printf (...)" is added on the "Breakpoints" window.


The execution result is displayed on the "Console" window. If the result of Dynamic Printf is not displayed on the "Console" window, select "Allocate console (necessary for input)" in the [Common] tab on the "Debug Configurations" screen.

# 9 CONNECTING CW-Sim AND DEBUGGING PROGRAMS

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This chapter explains how to connect CW-Sim and debug the programs.


For details on the available communication route for CW-Sim, refer to the following section.

 Page 21 Available communication route for CW-Sim/CW-Sim Standalone

## **Point**

For program to be debugged, select "SIMNTgnu\_SMP" on the [Build Support and Specs] tab of "Build Properties" in the property setting for a project, and build it.

There are other necessary property settings. For more details on the property settings, refer to the following section.

 Page 52 How to set the property

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## 9.1 Setting VxWorks Network Daemon

Configure the following three settings to use VxWorks network daemon on the simulator.

- Setting Routing and Remote Access service
- Setting network driver
- Setting TCP/IP

The procedure shown below with the screens are of Windows® 7, it may differ depending on the operating system.

### Setting Routing and Remote Access service

#### Operating procedure

**1.** Select any of the following:

- For Windows® 8 or later  
[All apps] ⇒ [Control Panel] ⇒ [System and Security] ⇒ [Administrative Tools] ⇒ [Services] on the Start screen of Windows®
- For Windows® 7  
[Control Panel] ⇒ [System and Security] ⇒ [Administrative Tools] ⇒ [Services] from the Start menu of Windows®
- For Windows® XP  
[Control Panel] ⇒ [Performance and Maintenance] ⇒ [Administrative Tools] ⇒ [Services] from the Start menu of Windows®

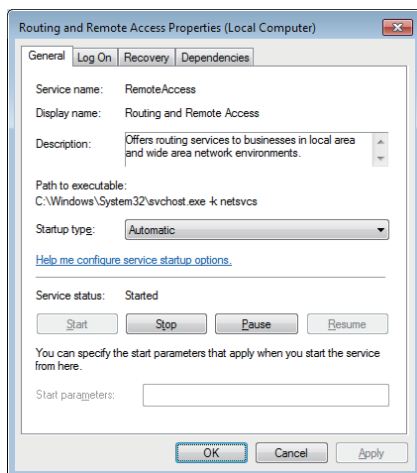
**2.** Double-click "Routing and Remote Access".

The "Routing and Remote Access properties" screen is displayed.

**3.** Select "Automatic" for "Startup type" and click the [Apply] button.

**4.** Click the [Start] button.

**5.** When the "Service status" becomes "Start", click the [OK] button.



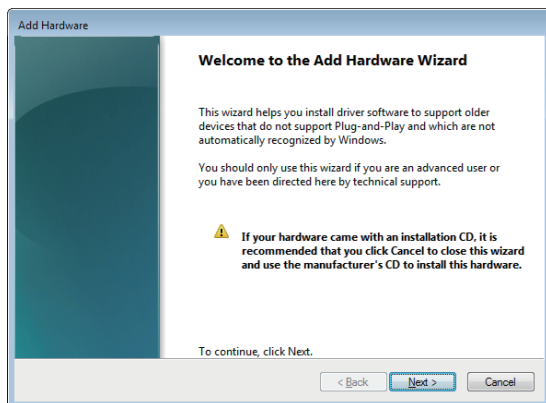
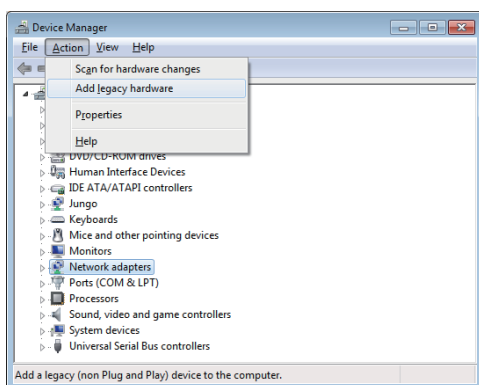
# Setting network driver

## Windows® 7 or later

### Operating procedure

**1.** Select either of the following:

- For Windows® 8 or later  
[All apps] ⇒ [Control Panel] ⇒ [Hardware and Sound] ⇒ [Device Manager] on the Start screen of Windows®
- For Windows® 7  
[Control Panel] ⇒ [Hardware and Sound] ⇒ [Device Manager] from the Start menu of Windows®



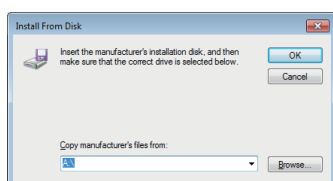
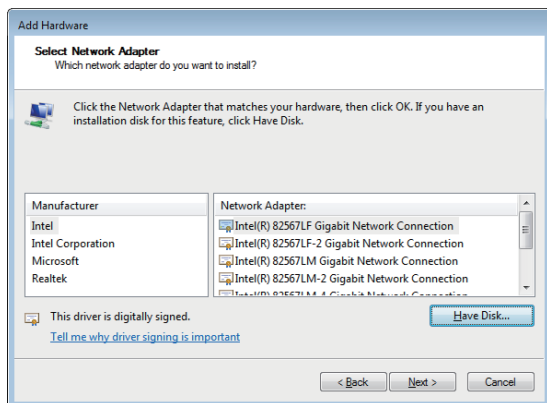
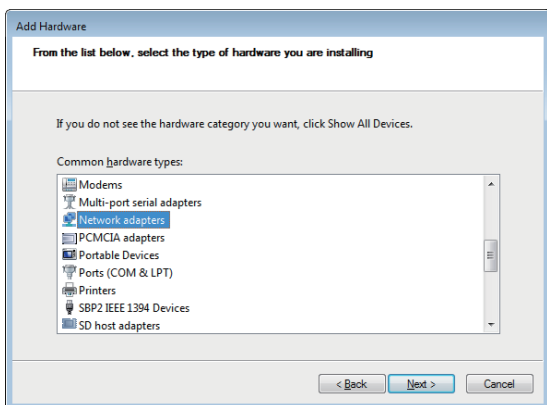
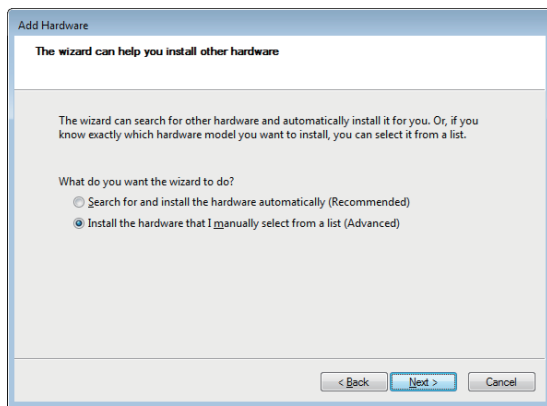
The "Device Manager" screen is displayed.

**2.** Select "Network adapters" and select [Action] ⇒ [Add legacy hardware].

The "Add Hardware" screen is displayed.

**3.** Click the [Next] button.





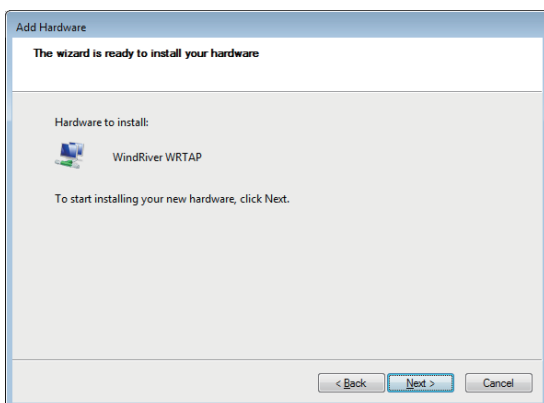
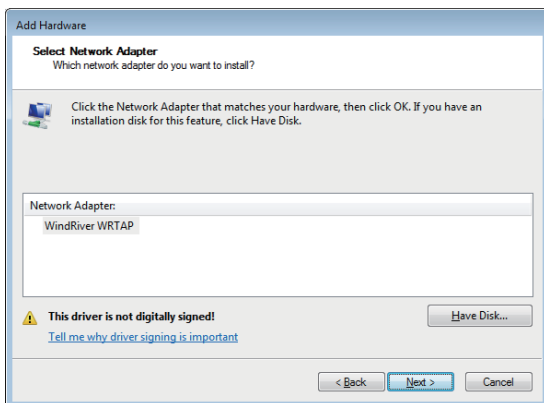
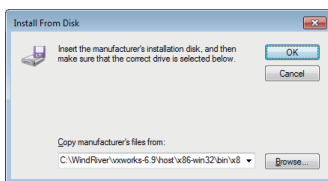
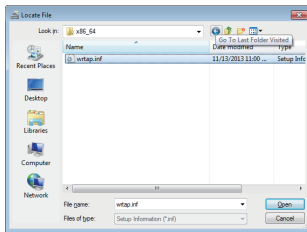
4. Select "Install the hardware that I manually select from a list (Advanced)" and click the [Next] button.

5. Select "Network adapters" and click the [Next] button.

6. Click the [Have Disk] button.

The "Install From Disk" screen is displayed.

7. Click the [Browse] button.



The "Locate File" screen is displayed.

**8.** Select "wrtap.inf" and click the [Open] button.

If the folder in which CW-Sim is installed is "C:\WindRiver", the folder for "wrtap.inf" is as follows:

- 32-bit version operation system  
C:\WindRiver\vxworks-6.9\host\x86-win32\bin
- 64-bit version operation system  
C:\WindRiver\vxworks-6.9\host\x86-win32\bin\x86\_64

If the folder in which CW-Sim Standalone is copied is "C:\CCPUSIM", the folder for "wrtap.inf" is as follows:

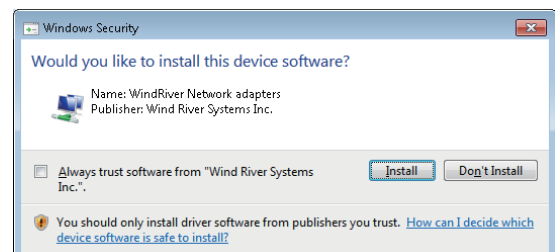
- 32-bit version operation system  
C:\CCPUSIM\CWSIMSA\vxsimnetd
- 64-bit version operation system  
C:\CCPUSIM\CWSIMSA\vxsimnetd\x86\_64

**9.** Click the [OK] button.

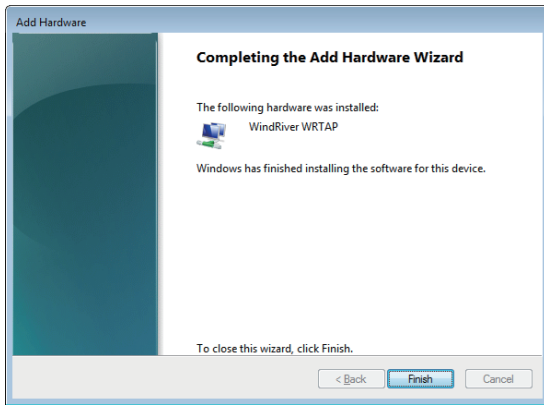
**10.** Select "WindRiver WRTAP" and click the [Next] button.

**11.** Click the [Next] button.

If the following message appears, click "Install".



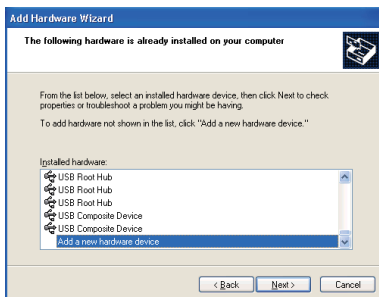
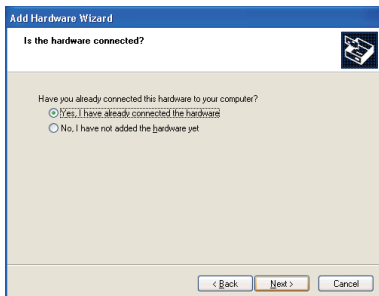
12. Click the [Finish] button.



If the following message appears on Windows® XP after the step 11, click the [Continue Anyway] button.



## Operating procedure



1. Select [Start] ⇒ [Control Panel] ⇒ [Add Hardware].

The "Add Hardware Wizard" screen is displayed.

2. Click the [Next] button.

3. Select "Yes, I have already connected the hardware" and click the [Next] button.

4. Select "Add a new hardware device" and click the [Next] button.

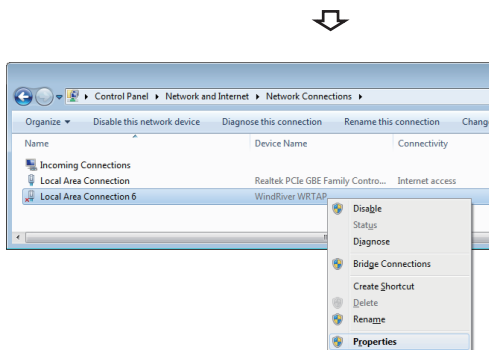
5. Go to the step 4 in the following section.

➡ Page 82 Windows® 7 or later

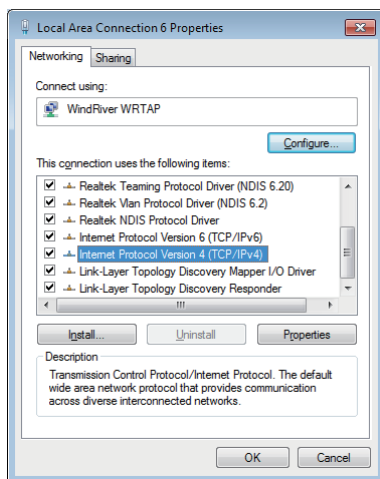
# Setting TCP/IP

## Operating procedure

1. Select any of the following:
  - For Windows® 8 or later  
[All apps] ⇒ [Control Panel] "View network status and tasks" ⇒ "Change adapter settings" on the Start screen of Windows®
  - For Windows® 7  
[Control Panel] ⇒ "View network status and tasks" ⇒ "Change adapter settings" from the Start menu of Windows®
  - For Windows® XP  
[Control Panel] ⇒ "Network and Internet Connections" ⇒ "Network Connections" from the Start menu of Windows®

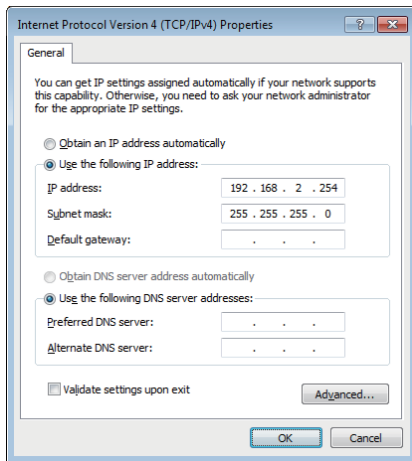


2. Right-click the local area connection with device name "WindRiver WRTAP", and select [Properties] from the shortcut menu.



The "Local Area Connection Properties" screen is displayed.

3. Select "Internet Protocol Version 4 (TCP/IPv4)" and click the [Properties] button.



The "Internet Protocol Version 4 (TCP/IPv4) Properties" screen is displayed.

- 4.** Select "Use the following IP address", and set "IP address" and "Subnet mask".
- 5.** Click the [OK] button.

## 9.2 Starting VxWorks Network Daemon

This section explains the startup procedure of VxWorks network daemon after CW Workbench and CW-Sim are installed to "C:\WindRiver".

### Creating VxWorks network configuration file

**Ex.**

Create a text file 'vxsimnetd.conf' in "C:\CCPUSIM".

Content of "vxsimnetd.conf" is as follows:

```
SUBNET_START sub2 {
    SUBNET_ADDRESS = "192.168.2.0";
    SUBNET_EXTERNAL = yes;
    SUBNET_EXTPROMISC = yes;
};
```

Modify the contents of "vxsimnetd.conf" as necessary by referring the following document and checking the contents.

 WindRiver VxWorks Simulator User's Guide

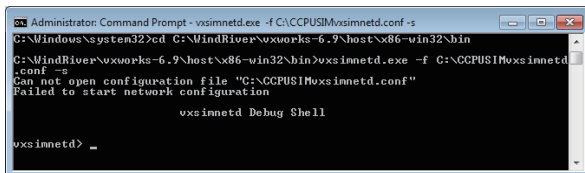
#### Point

A sample of "vxsimnetd.conf" is stored in the folder "\Samples\English" on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD).

### Starting up VxWorks network daemon

Start VxWorks network daemon once after the personal computer boots successfully.

#### Operating procedure



1. Select [All Programs] ⇒ [Accessory]<sup>\*1</sup> ⇒ [Command Prompt] from Windows® Start.

<sup>\*1</sup> For Windows® 8 or later, select [All apps] on the Start screen. The Command Prompt is started.

Execute the command prompt as administrator.

2. Enter the following command to change the current directory to the folder in which CW-Sim is installed.
  - cd C:\WindRiver\vxworks-6.9\host\x86-win32\bin
3. Enter the following command to start the VxWorks network daemon.
  - vxsimnetd.exe -f C:\CCPUSIM\vxsimnetd.conf -s

#### Point

Do not close the command prompt on which VxWorks network daemon is started during debugging. Otherwise, the VxWorks network daemon will be terminated.

## 9.3 Starting Simulator

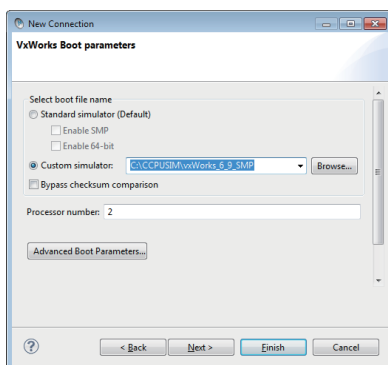
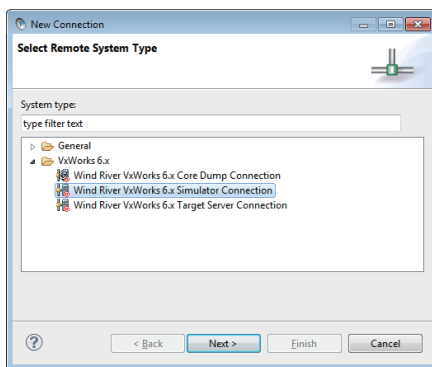
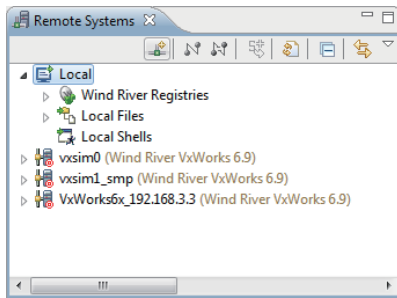
This section explains how to start the simulator.

In the 'Operating procedure', as an example, the setting of the following virtual network is described.

IP address: 192.168.2.1

Default gateway: 192.168.2.254

### Operating procedure



1. Click  on the "Remote Systems" window.


The "New Connection" screen is displayed.

2. Select the "Wind River VxWorks 6.x Simulator Connection", and click the [Next] button.

3. Select "Custom simulator" under "Select boot file name" and enter the path to the VxWorks image file and file name.

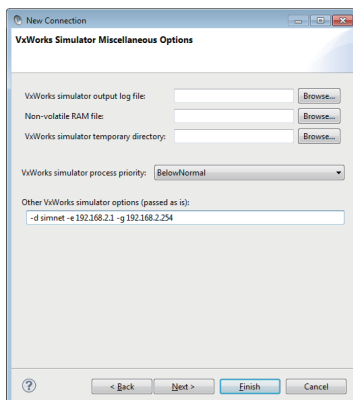
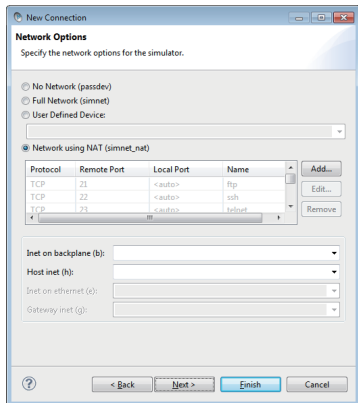
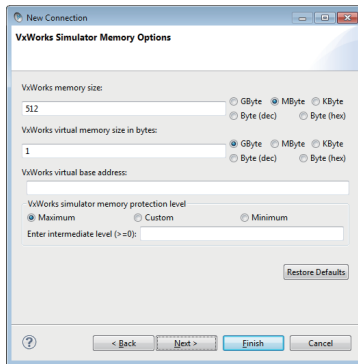
The example of a path to the VxWorks image file and file name is as follows:

- C:\CCPUSIM\vxWorks\_6\_9\_SMP

 Page 36 Copying VxWorks image/symbol files (CW-Sim)

4. Click the [Next] button.





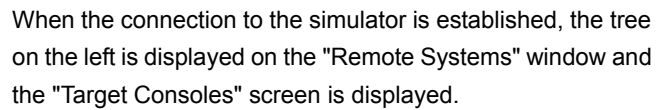
5. Click the [Next] button.

6. Click the [Next] button.

7. Set the IP address and default gateway of the virtual network in "Other VxWorks simulator options".

-d simnet -e 192.168.2.1 -g 192.168.2.254

8. Click the [Finish] button.



Start the simulator in advance.

👉 Page 74 Debugging User Programs

# 10 CONNECTING CW-Sim Standalone AND DEBUGGING PROGRAMS

10

This chapter explains how to connect to CW-Sim Standalone and debug the programs.

For details on the available communication route for CW-Sim Standalone, refer to the following section.

☞ Page 21 Available communication route for CW-Sim/CW-Sim Standalone

## Point

For program to be debugged, select "SIMNTgnu\_SMP" on the [Build Support and Specs] tab of "Build Properties" in the property setting for a project, and build it.

There are other necessary property settings. For more details on the property settings, refer to the following section.

☞ Page 52 How to set the property

## 10.1 Setting VxWorks Network Daemon

Configure the following three settings to use VxWorks network daemon on the simulator.

- Setting Routing and Remote Access service
- Setting network driver
- Setting TCP/IP

For the setting methods, refer to the following section.

☞ Page 81 Setting VxWorks Network Daemon

## 10.2 Starting VxWorks Network Daemon

This section explains the startup procedure of VxWorks network daemon after CW-Sim Standalone is installed to "C:\CCPUSIM".

### Creating VxWorks network configuration file

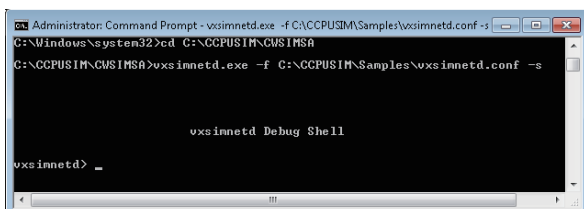
For the creation methods, refer to the following section.

☞ Page 89 Creating VxWorks network configuration file

### Starting VxWorks network daemon

Start the VxWorks network daemon once after the personal computer boots successfully.

#### Operating procedure



1. Select [All Programs] ⇒ [Accessory]<sup>\*1</sup> ⇒ [Command Prompt] from Windows<sup>®</sup> Start.

<sup>\*1</sup> For Windows<sup>®</sup> 8, Select [All apps] on the Start screen. The command prompt is started.

Execute the command prompt as administrator.

2. Enter the following command to change the current directory to the installation folder of CW-Sim Standalone.

- cd C:\CCPUSIM\CWSIMSA\vxsimnetd

3. Enter the following command to start the VxWorks network daemon.

- vxsimnetd.exe -f C:\CCPUSIM\Samples\vxsimnetd.conf -s



- For activating multiple simulators, specify a processor number by adding the "-p" option.
- If ""STARTUP.CMD" file dose not exist" is displayed during startup and the script is not executed, change the current directory to the folder containing the script file "STARTUP.CMD" and enter the following command.

```
C:\CCPUSIM\CWSIMSA\vxsim69\vxsim69-nl.exe -f C:\CCPUSIM\vxWorks_6_9_SMP -d simnet -e 192.168.2.1 -g 192.168.2.254 -p 0
```

- For the arguments of each command, refer to the following manual.

 Wind River VxWorks Simulator User's Guide, 6.9

# 11 USAGE EXAMPLE OF CW-Sim USING SAMPLE PROGRAM

This chapter explains the usage of CW-Sim using a sample program.

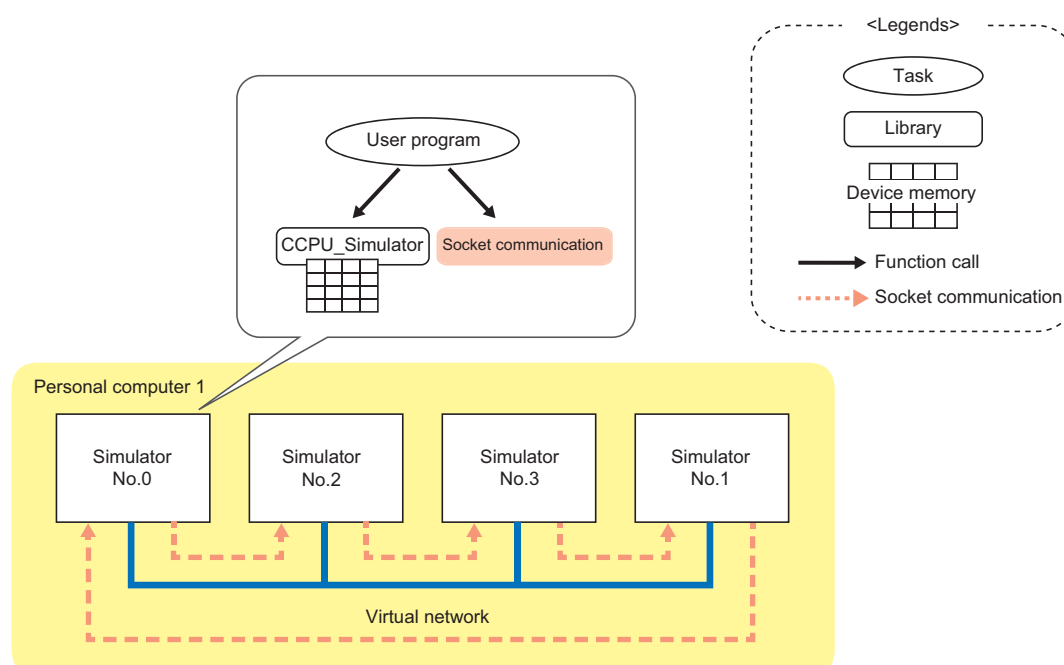
## 11.1 Features of Sample Program

This section explains the features of sample program.

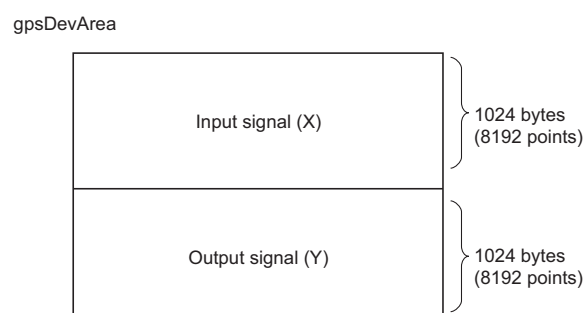
### Configuration of sample program

The following information explains and figure shows the sample programs stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) and the system configuration at execution of the sample program.

- The system consists of four simulators, and each of which is connected to the virtual network.
- On each simulator, C Controller module dedicated functions in the dedicated function library stub (CCPU\_Simulator) and user programs using socket communication are running.



In CCPU\_Simulator, the following device memory is simulated.



## Operation of sample program

### Simulator No.0

1. Establish the TCP/IP connections with the previous (No.3) and next (No.1) simulators.
2. Monitor X0 to X8191, when X device is turned ON then, Y device data same device number as X device is turned ON.
3. Send the device number of X device of which ON status is detected in the step 2 to the next simulator (No.1) with the socket communication.
4. When the ON notification of X device is received from the previous simulator (No.3), inversely output the data to Y device with the same device number as ON-notified X device number.
5. Read the data of ON-notified X device number and transfer the same data to the next simulator (No.1) if the status is ON.
6. Repeat the steps from 1 to 5.

The Y device turns ON and OFF repeatedly by the above operation.

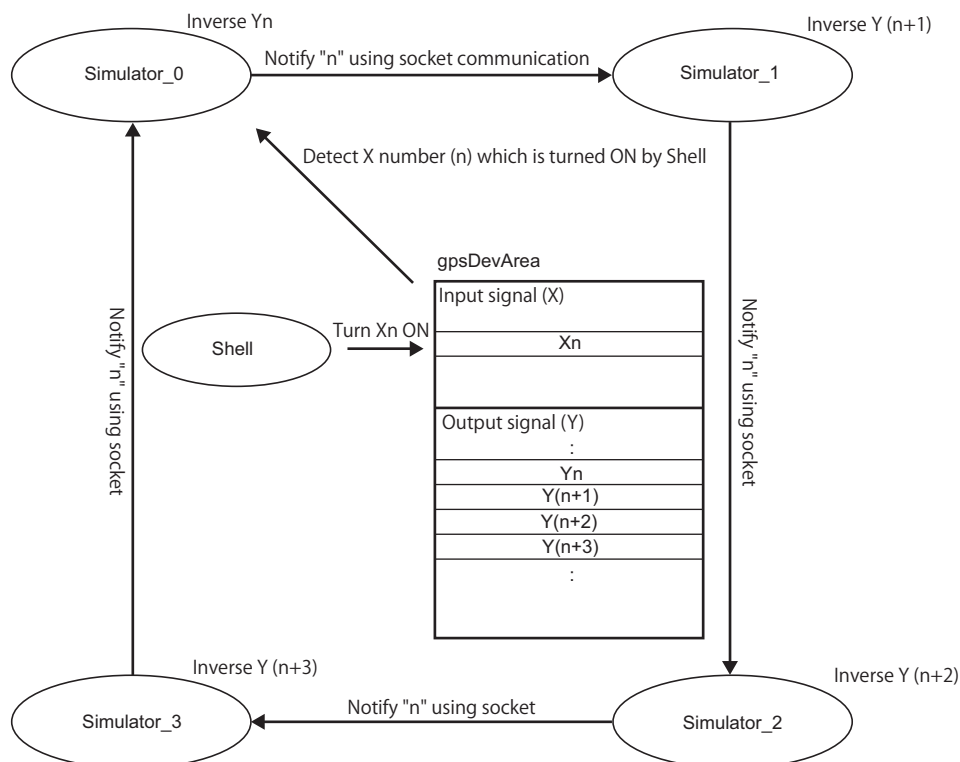
### Simulators from No.1 to No.3

1. Establish the TCP/IP connections with the previous and next simulators.
2. If the ON notification of X device is received from the previous simulator, inversely output the data to the following Y device.
  - No.1: Y device with the ON notified device number + 1
  - No.2: Y device with the ON notified device number + 2
  - No.3: Y device with the ON notified device number + 3
3. Transfer the ON notification received in the step 2 to the next simulator.
4. Repeat the step 2 and step 3.

These operations turn the Y devices ON and OFF repeatedly.

### Operation of sample program

For the operation of the sample program, refer to the following figure.



# 11.2 Utilizing Sample Program

This section explains the procedure for utilizing the sample program.

## Preparing sample program

Copy the sample program stored on the CW Workbench/CW-Sim DVD-ROM (SW1DND-CWWR-EDVD) to a local folder.

For the storage destination of the sample program, refer to the following section.

☞ Page 24 Contents of DVD-ROM/CD-ROM

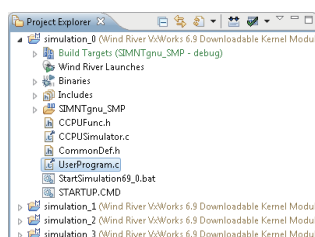
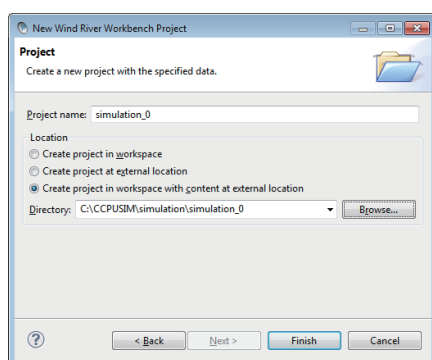
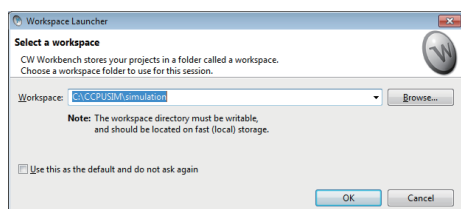
**Ex.**

Copy destination local folder

C:\CCPUSIM

## Opening sample program

### Operating procedure



1. Select [Wind River] ⇒ [CW Workbench 3.3] ⇒ [CW Workbench 3.3] from Windows® Start\*1.

\*1 Select [All apps] on the Start screen or [Start] ⇒ [All Programs].

The "Workspace Launcher" screen is displayed.

2. Specify the folder in which the sample program has been copied to "Workspace:".

A folder can also be selected by clicking the [Browse] button.

3. Click the [OK] button.

CW Workbench is started.

4. Create a new project as shown in the procedure from step 4 to 6 below.

☞ Page 50 How to create a new project

The following four projects are the projects to be newly created.

- simulation\_0
- simulation\_1
- simulation\_2
- simulation\_3

5. Set the property of each project by following the procedure shown in the section below.

☞ Page 52 How to set the property

6. Double-click each sample program, "UserProgram.c" on the "Project Explorer" window to display and edit the sample program.

In this sample program, the stub for some C Controller module dedicated functions is defined in "CCPUFunc.h". Add a stub as necessary.




## 11.3 Building Project

---

The section explains the procedure to build a project in which a sample program is used.

For details on errors displayed after the completion of building a project and execution files to be generated, refer to the following section.

 Page 62 Building Project

### Operating procedure

1. Select the project to be built on the "Project Explorer" window. Right-click and select [Refresh] from the shortcut menu.
2. Select the project to be built on the "Project Explorer" window. Right-click and select [Rebuild Project] from the shortcut menu.

#### Point

Perform [Refresh] and [Rebuild Project] for the following four projects included in the sample program.

- simulation\_0
- simulation\_1
- simulation\_2
- simulation\_3

## 11.4 Starting VxWorks Network Daemon

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For more details on how to set and start VxWorks network daemon, refer to the following section.

 Page 81 Setting VxWorks Network Daemon

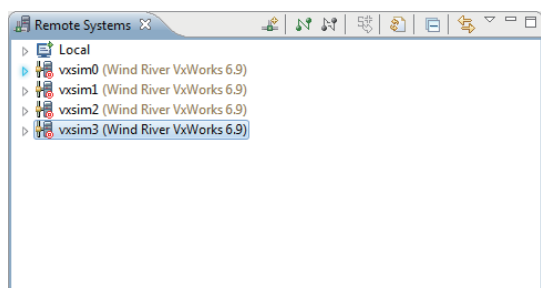
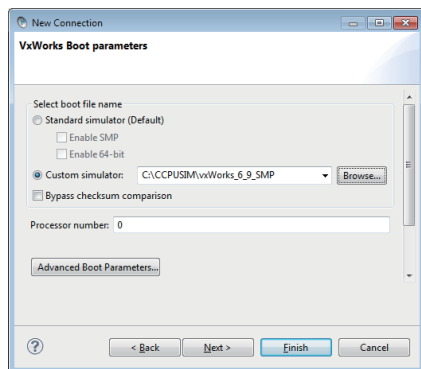
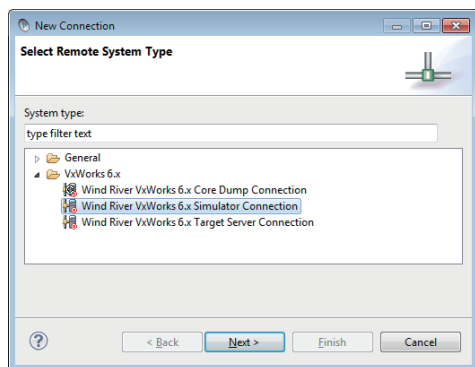
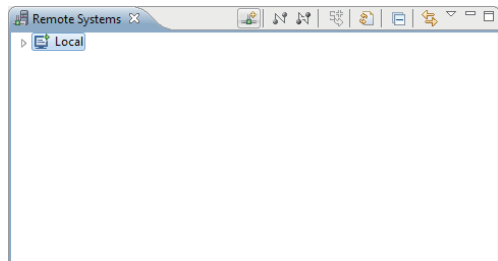
 Page 89 Starting VxWorks Network Daemon

## 11.5 Creating Simulator

The sample program uses four simulators, vxsim0 to vxsim3.

Perform the following operations four times to create the simulators, vxsim0 to vxsim3.

### Operating procedure



1. Click  on the "Remote Systems" window.

The "New Connection" screen is displayed.

2. Select "Wind River VxWorks 6.x Simulator Connection" and click the [Next] button.

3. Select "Custom simulator" under "Select boot file name", and enter the path to the VxWorks image file and file name.


The example of a path to the VxWorks image file and file name is as follows:

- C:\CCPUSIM\vxWorks\_6\_9\_SMP

 Page 36 Copying VxWorks image/symbol files (CW-Sim)

4. Click the [Finish] button.

When the connection to the simulator is established, the tree to the left is displayed on the "Remote Systems" window and the "Target Consoles" screen is displayed.

5. Click  on the "Remote Systems" window and close the "Target Consoles" screen.

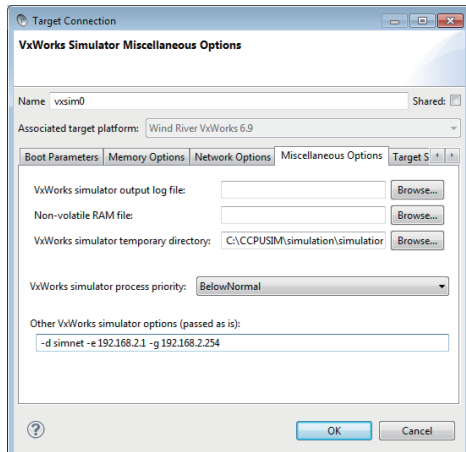
## 11.6 Setting Simulator

Perform the following operations four times to configure the settings for simulators, vxsim0 to vxsim3.

### Operating procedure

1. Select each simulator (vxsim0 to vxsim3) on the "Remote Systems" window. Right-click and select [Properties] from the shortcut menu.

The "Target Connection" screen is displayed.



2. Specify the save folder of the "STARTUP.CMD" file for "VxWorks simulation temporary directory" in the [Miscellaneous Options] tab.

For the project to be debugged, leave the settings blank.

Example) When the sample program has been saved in "C:\CCPUSIM\simulation", the settings of each "VxWorks simulation temporary directory" are as follows:

- vxsim0: "C:\CCPUSIM\simulation\simulation\_0"
- vxsim1: "C:\CCPUSIM\simulation\simulation\_1"
- vxsim2: "C:\CCPUSIM\simulation\simulation\_2"
- vxsim3: "C:\CCPUSIM\simulation\simulation\_3"

3. Set the IP address and default gateway of the virtual network for "Other VxWorks simulator options".

Example) When the gateway is "192.168.2.254", the setting of "Other VxWorks simulator options" is as follows:

- IP address of vxsim0 (No.0) "192.168.2.1": "-d simnet -e 192.168.2.1 -g 192.168.2.254"
- IP address of vxsim1 (No.1) "192.168.2.2": "-d simnet -e 192.168.2.2 -g 192.168.2.254"
- IP address of vxsim2 (No.2) "192.168.2.3": "-d simnet -e 192.168.2.3 -g 192.168.2.254"
- IP address of vxsim3 (No.3) "192.168.2.4": "-d simnet -e 192.168.2.4 -g 192.168.2.254"


4. Click the [OK] button to complete the settings of CW-Sim.

### Point

After changing the setting of IP address, change the IP address definitions in the sample program as well and rebuild the project.

# 11.7 Executing Sample Program

## Operating procedure

1. On the "Remote Systems" window, select the simulators, vxsim0 to vxsim3, and click  to startup CW-Sim.

Startup CW-Sim in the following order:

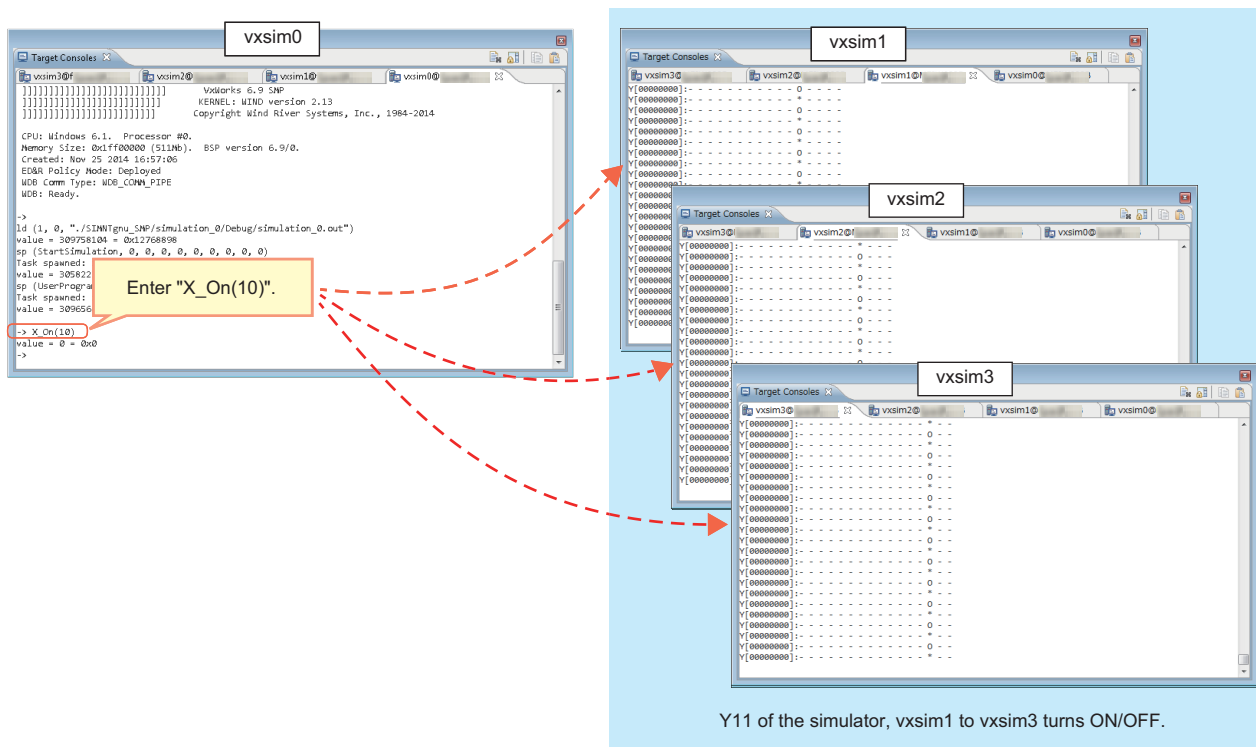
- vxsim3 (No.3)
- vxsim2 (No.2)
- vxsim1 (No.1)
- vxsim0 (No.0)

2. Execute the X\_On function on the "Target Consoles" screen of the simulator, vxsim0, to run the sample programs.

For example, when "X\_On(10)" is entered, X10 turns ON, and Y device turns ON/OFF.

ON/OFF status of Y devices is displayed on the "Target Consoles" screen of the simulators, vxsim1 to vxsim3 as follows:

- "\*" = ON
- "0" = OFF
- "-" = Not displayed



# PART 4

# TROUBLESHOOTING

This part explains the errors which may occur when using CW Workbench or CW-Sim, and their troubleshooting.

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12 TROUBLESHOOTING

---

13 LICENSE ERRORS

---

# 12 TROUBLESHOOTING

This chapter explains the cause(s) of error(s) which may occur during the use of CW Workbench and CW-Sim, with their respective corrective action(s).

## 12.1 Common Troubleshooting

### Error description

The following table shows the common errors which may occur on CW Workbench and CW-Sim.

Category	Problem/Reference
Installation	Page 104 The installation process has stopped halfway or has terminated suddenly before completion.
Installation (temporary license)	Page 105 An error message appears and installation does not proceed further in case of LAC and User information is provided and clicked [Next] button.
License	Page 105 Not aware of usage of the acquired permanent license file. Page 105 Not aware of the method for deleting permanent license file.
Startup	Page 105 CW Workbench does not start when message "Workspace in use or cannot be created, choose a different one" appears. Page 105 The displayed contents do not change after patch has been applied. Page 106 [Wind River] ⇨ [Product Maintenance] does not exist in the Start menu/Start screen of Windows®.
Building	Page 106 An error, "command not found" has occurred and the build is not executed. Page 106 An error such as "no input files", "No Such file", or "No such file or directory" has occurred. Page 106 An error, "Build target "/yyy/nnnn_partialImage" used in build target "yyy" not found" has occurred and the build is not executed. Page 106 A build error, "xxx.sh: syntax error near unexpected token `yyy_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: *** missing separator. Stop", or "yy.o: command not found...No such file or directory" has occurred. Page 106 The '.out' file is not created. The build is terminated with a message "Generation of makefiles started."

### Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

#### Installation

##### ■The installation process has stopped halfway or has terminated suddenly before completion.

Cause	Corrective action
Characters other than alphanumeric characters, an underscore "_", or a hyphen "-" is used for the folder name of the installation destination.	Use the following characters for naming the installation and/or reinstallation of CW Workbench destination folder. <ul style="list-style-type: none"><li>• Alphanumeric characters (A space cannot be used.)</li><li>• Underscore "_", hyphen "-"</li></ul>

## Installation (temporary license)

■ **An error message appears and installation does not proceed further in case of LAC and User information is provided and clicked [Next] button.**

Error message	Cause	Corrective action
HTTP Server: Bad Gateway	The access target HTTP server is not responding properly.	Wait for a while, and try to install the products again. If the problem still remains, install the products another day.
Unknown Host:	The personal computer in use is connected to the Internet via a proxy server.	Use the [Back] button and go back to the "Installer-Online Update Settings" screen. Then, select "Connect to internet using a proxy server", and configure the proxy server setting.
Unable to read repository at Unable connect to repository <sup>*1</sup>	The personal computer could not connect to Internet.	Check if the personal computer can connect to Internet, and install the products on the personal computer connected to the Internet. When the personal computer is connected via a proxy server, take corrective actions shown with the error message (Unknown Host).

\*1 Only when CW-Sim is used.

## License

■ **Not aware of usage of the acquired permanent license file.**

Store the acquired permanent license file in the license folder of personal computer on which CW Workbench is installed.

📖 Page 37 Applying Permanent License

■ **Not aware of the method for deleting permanent license file.**

Delete all the files in the license folder of personal computer on which CW Workbench is installed.

📖 Page 42 Deleting Permanent License

## Startup

■ **CW Workbench does not start when message "Workspace in use or cannot be created, choose a different one" appears.**

Cause	Corrective action
The Workspace folder specified during the startup of CW Workbench is being used by other instance of CW Workbench.	<ul style="list-style-type: none"> <li>Click the [OK] button, and select a different folder on the displayed Workspace folder specification screen.</li> <li>Terminate the running CW Workbench.</li> </ul>

■ **The displayed contents do not change after patch has been applied.**

Cause	Corrective action
Old data is stored in the cache.	When starting CW Workbench, specify "-clean" to the argument.

- How to specify "-clean"

## Operating procedure

1. Select the shortcut of CW Workbench on the desktop. Right-click and select [Properties] from the shortcut menu.
2. Enter a space at the end of "Target:" on the "CW Workbench Properties" screen. Enter "-clean" after the space and click the [OK] button.

### Point

Delete "-clean" argument after use, because keeping argument "-clean" slows the startup of CW Workbench.

- How to delete "-clean"

In the step 2 above, delete a space and "-clean", and then click the [OK] button.

■[Wind River] ⇒ [Product Maintenance] does not exist in the Start menu/Start screen of Windows®.

Cause	Corrective action
The existing CW Workbench and newly installed CW Workbench may have the same installation folder.	Uninstall CW Workbench as explained below, and install CW Workbench in a different folder from the one with the existing CW Workbench. ☞ Page 107 Uninstallation process is cancelled in the halfway.

## Building

■An error, "command not found" has occurred and the build is not executed.

Cause	Corrective action
An unsupported compiler has been set to CW Workbench.	Check that any unsupported compilers have not been specified.

- How to check

### Operating procedure

1. Select [Project] ⇒ [Properties] to display the screen of property.
2. Select "Build Properties" from the tree on the left on the screen, and select the [Build Support and Specs] tab.
3. Check that any unsupported compilers have not been selected for "Available and enabled build specs".

■An error such as "no input files", "No Such file", or "No such file or directory" has occurred.

Cause	Corrective action
The source file has not been registered in the project to be built.	Create a new file with extension of '.c' or '.cpp' or change the file extension to '.c' or '.cpp'. Execute the build after registering the file to the build project. • Creating new project: ☞ Page 50 Creating New Projects • Change of file name: Select the file name to be changed. Right-click and select [Rename] from the shortcut menu, or press <b>F2</b> .

■An error, "Build target "/yyyy/nnnn\_partialImage" used in build target "yyyy" not found" has occurred and the build is not executed.

Cause	Corrective action
The file with the same name as the project name has been renamed.	Create a new project and move the source file from the project where an error occurs. ☞ Page 50 Creating New Projects

### Point

When deleting a project in which an error occurs, a confirmation message appears. Check whether the checkbox is selected or unselected, and be sure not to delete the necessary file by mistake.

- Unselected: The project is deleted from the workspace. The file is left on the hard disk.
- Selected: The project is deleted from the hard disk as well as from the workspace. The deleted file cannot be recovered.

■A build error, "xxx.sh: syntax error near unexpected token `yyy\_partialImage/Debug/Objects/nnn'", "xxx.sh: cannot execute binary file", "Makefile:xxx: \*\*\* missing separator. Stop", or "yy.o: command not found...No such file or directory" has occurred.

Cause	Corrective action
A character that cannot be used is included in the source file name.	Remove the following symbols that cannot be used from the file name shown in 'nnn' in the error message, and from the source file name added to the project. • #, \$, &, ', (, ), :, =, `, two-byte characters, katakana Remove the following symbols that cannot be used on Windows® for file names. • \, /, :, *, ?, ", <, >,

■The '.out' file is not created. The build is terminated with a message "Generation of makefiles started.".

Cause	Corrective action
The source file name contains "\$".	Remove "\$" from the source file name.



## 12.2 CW Workbench Troubleshooting

### Error description

The errors that may occur when using CW Workbench are shown below.

Category	Problem/Reference
Installation	Page 107 The install menu of the plug-in software cannot be found.
	Page 107 Only [Wind River] ⇒ [Product Maintenance] is installed in the Start menu/Start screen of Windows®.
Uninstallation	Page 107 Uninstallation process is cancelled in the halfway.
	Page 108 Uninstallation process has suddenly stopped before completion.
Startup	Page 108 CW Workbench does not start when message "The install root of your Wind River Workbench installation could not be located!" appears.
License	Page 108 An error message, "License Not Found" appears when CW Workbench is started or being operated.
Target connection	Page 108 CW Workbench cannot be connected to C Controller module.
	Page 109 An error occurs and the connection fails (Failed to Connect to Target) when 'Connect' is executed on the "Remote Systems" window, OR, the connection status of the Remote Systems is suddenly changed from 'connected' to 'disconnected'.
	Page 109 The selected "Target Connection" settings are not imported.
	Page 109 The screen to select "Target platform" appears when configuring the target server connection setting.
Downloading	Page 109 The '.out' file failed to download on C Controller module.
	Page 109 The '.out' file sometimes cannot be downloaded to C Controller module.

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### Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

#### Installation

##### ■The install menu of the plug-in software cannot be found.

Select [Help] ⇒ [Install New Software] to install the plug-in software.


If [Install New Software] cannot be found, CW Workbench is in the "Basic Device Development" display mode. Change the current display mode to "Advanced Device Development".

The display mode of CW Workbench is displayed on the title bar.

- How to change the display mode

#### Operating procedure

1. Select [Window] ⇒ [Open Perspective] ⇒ [Advanced Device Development].

Or, click the Open Perspective icon (  ) at the upper right corner of CW Workbench, and select [Advanced Device Development] from the displayed menu.

2. Check that the display on the title bar of CW Workbench has been changed to "Advanced Device Development".

3. Select [Help] ⇒ [Install New Software] to install the plug-in software.

##### ■Only [Wind River] ⇒ [Product Maintenance] is installed in the Start menu/Start screen of Windows®.

Reinstall CW Workbench using a permanent license file for CW Workbench.

##### ■Uninstallation process is cancelled in the halfway.

Use either of the methods given below to complete the uninstallation:

- Execute the <installation destination folder>\maintenance\wrlInstaller\x86-win32\wrlInstaller.exe to uninstall.
- Delete the installation destination folder manually.

## ■Uninstallation process has suddenly stopped before completion.

Try the uninstallation again.

📖 Page 43 Uninstallation

If CW Workbench still cannot be uninstalled, refer to the following troubleshooting.

📖 Page 107 Uninstallation process is cancelled in the halfway.

## Startup

### ■CW Workbench does not start when message "The install root of your Wind River Workbench installation could not be located!" appears.

Cause	Corrective action
Characters other than alphanumeric characters, an underscore "_", or a hyphen "-" have been used for the folder name in which CW Workbench is installed.	At first, uninstall CW Workbench, then use the following characters for naming the installation and/or reinstallation of CW Workbench destination folder. <ul style="list-style-type: none"><li>• Alphanumeric characters (A space cannot be used.)</li><li>• Underscore "_", hyphen "-"</li></ul>

## License

### ■An error message, "License Not Found" appears when CW Workbench is started or being operated.

An error has occurred with the license file being used for CW Workbench.

📖 Page 112 LICENSE ERRORS

## Target connection

### ■CW Workbench cannot be connected to C Controller module.

Symptom	Cause	Corrective action
[Log Console] A message, "Differences for module 'xxxxxxx' segment's address" appears.	The VxWorks image file of C Controller module is not the same as that of CW Workbench.	Match the VxWorks image files to be used between C Controller module and CW Workbench. 📖 Page 66 Setting Target Server
A message, "Failed to Connect to Target" appears.	C Controller module is not connected to the CW Workbench network, or the IP address setting is wrong.	Check the following status: <ul style="list-style-type: none"><li>• The power supply for the C Controller module is ON.</li><li>• The C Controller module is operating properly. (No error has occurred.)</li><li>• The Ethernet cable connector connecting the personal computer to the C Controller module is fully inserted into the Ethernet port.</li><li>• The Ethernet cable is connected. In addition, the LEDs for each Ethernet port turn ON.</li><li>• IP addresses of the personal computer and the C Controller module have been set properly.</li></ul>
Others	The host name of the personal computer on which CW Workbench has been installed is set with only one character or 16 or more characters, or two-byte characters or katakana are included.	Set the host name for the personal computer within 2 to 15 alphanumeric characters.

### Point

If the error still persists after taking the corrective actions shown above, delete the cache folder, and restart CW Workbench. (It may take time to startup for the first time after the cache folder was deleted.)

Cache folder: "C:\Documents and Settings\(\user name)\.workbench-3.3.x.xxxxxxxx-xxxx"

- User name: The user name currently logged on
- x: A value added automatically


■An error occurs and the connection fails (Failed to Connect to Target) when 'Connect' is executed on the "Remote Systems" window, OR, the connection status of the Remote Systems is suddenly changed from 'connected' to 'disconnected'.

Cause	Corrective action
'Connect' has been executed on the "Remote Systems" window of CW Workbench from multiple personal computers for one C Controller module.	Do not execute 'Connect' on multiple personal computers to one C Controller module at the same time.
'Connect' has been executed on two or more "Remote Systems" windows of CW Workbench from one personal computer for one C Controller module.	Do not execute 'Connect' from the "Remote Systems" window of CW Workbench multiple times to one C Controller module.

■The selected "Target Connection" settings are not imported.

Cause	Corrective action
Import operation was performed with the multiple "Target Connection" settings selected.	Import the "Target Connection" settings individually those are not imported.

■The screen to select "Target platform" appears when configuring the target server connection setting.


Cause	Corrective action
The existing CW Workbench and newly installed CW Workbench may have the same installation folder.	Uninstall CW Workbench as explained below, and install CW Workbench in a different folder from the one with the existing CW Workbench.  Page 107 Uninstallation process is cancelled in the halfway.

## Downloading

■The '.out' file failed to download on C Controller module.

Cause	Corrective action
Unavailable characters or symbols are used for the path of the specified '.out' file or file name. <ul style="list-style-type: none"> <li>• Displayed message</li> <li>• "Problem Occurred" message</li> <li>• "Launch step finished with this error: File not found:"</li> </ul>	Specify the '.out' file or file name in which the following characters or symbols are not included, and download it again. <ul style="list-style-type: none"> <li>• Unavailable characters and symbols: ' , * , : , ; , . , &lt; , &gt; , / , ? , space, two-byte characters, katakana</li> </ul>

■The '.out' file sometimes cannot be downloaded to C Controller module.

Cause	Corrective action
A two-byte character or katakana is included in the path of VxWorks image file specified in the target server setting.	Remove the two-byte characters or katakana from the path of VxWorks image file.  Page 66 Setting Target Server

# 12.3 CW-Sim Troubleshooting

## Error description

The following shows errors that may occur when using CW-Sim.

Category	Problem/Reference
Installation	Page 110 When selecting a license file, the message, "Your Product Activation File does not have a valid install key for any Products on Disk. Please re-enter a new Product Activation File." appears, and the installation fails.
License	Page 110 Simulator does not start when message "Checking License...ERROR" appears during startup. Page 110 Simulator does not start when message "Step finished with this error" appears during startup.
Simulator startup	Page 111 CW-Sim does not start when message "Windows cannot find 'vxsim'. Make sure you typed the name correctly, and then try again" is displayed. Page 111 Virtual network is not enabled in case of during startup of VxWorks network daemon, the warning message "WARNING: subnet(***)external configuration failed (can't find a WRTAP network connection to use).", or the error message, "[SC] OpenSCManager FAILED 5: Access denied" appears. Page 111 Communication with the simulator cannot be established.

## Corrective action

The cause(s) of errors and their respective corrective action(s) are explained below.

### Installation

■ **When selecting a license file, the message, "Your Product Activation File does not have a valid install key for any Products on Disk. Please re-enter a new Product Activation File." appears, and the installation fails.**

An error has occurred in license file checking during CW-Sim installation.

The causes of the license error and their corrective actions are shown below:

Cause	Corrective action
The specified file is not a license file for CW-Sim. (A license file for a different product such as CW Workbench has been specified.)	Check the license file, and apply the license file for CW-Sim.
CW-Sim has been already installed.	Uninstall CW Workbench and CW-Sim to delete the license files, and then reinstall CW Workbench and CW-Sim.
An invalid license is used. (The host information registered at the time of permanent license acquisition is incorrect.)	Check the host information registered at the time of permanent license acquisition, and correct the Host ID if incorrect.
"MAC" is used as a host information for permanent license application.	Check the Host ID of the personal computer on which CW-Sim is actually used, and correct the Host ID if incorrect.
When "DISK" is used as the host information for permanent license application, a volume serial number other than the C drive has been specified as Host ID.	Specify the volume serial number of the C drive as Host ID.

#### • How to correct Host ID

Apply for license transfer using License Transfer Certification Agreement Form "PermanentLicenseApplicationForm.xls" stored on the DVD-ROM. (☞ Page 27 Acquiring/Reacquiring Permanent License)

Cause	Corrective action
The Host ID is incorrect.	Fill the following Host ID. <ul style="list-style-type: none"><li>• "Current license": The wrong Host ID registered previously</li><li>• "New license": The correct Host ID to be registered</li></ul>
The Host ID is correct.	Please consult your local Mitsubishi representative from which the CW-Sim was purchased.

### License

■ **Simulator does not start when message "Checking License...ERROR" appears during startup.**

An error has occurred in license file checking during CW-Sim startup.

Cause	Corrective action
When using CW-Sim with a temporary license, 31 days have passed since CW-Sim was installed.	Acquire the permanent license and overwrite the existing temporary license file.
An invalid license is used. (The host information registered at the time of permanent license acquisition is incorrect.)	Refer to the following section. ☞ Page 110 Installation

■ **Simulator does not start when message "Step finished with this error" appears during startup.**

An error has occurred in license file checking during CW-Sim startup.

Cause	Corrective action
The LAC entered at the time of CW-Sim installation is not correct.	Use the correct LAC, and reinstall CW-Sim.

## Simulator startup

■ **CW-Sim does not start when message "Windows cannot find 'vxsim'. Make sure you typed the name correctly, and then try again" is displayed.**

Cause	Corrective action
CW Workbench and CW-Sim were installed in different folders.	Install CW Workbench and CW-Sim in the same folder.

■ **Virtual network is not enabled in case of during startup of VxWorks network daemon, the warning message "WARNING: subnet(\*\*\*)external configuration failed (can't find a WRTAP network connection to use).", or the error message, "[SC] OpenSCManager FAILED 5: Access denied" appears.**

Execute commands on the command prompt as an administrator.

To execute commands as an administrator, start the command prompt by following the procedure below.

### Operating procedure

1. Select [Start] ⇒ [All Programs] ⇒ [Accessory]<sup>\*1</sup>.

<sup>\*1</sup> For Windows<sup>®</sup> 8, Select [All apps] on the Start screen.

2. Right-click [Command Prompt] and select [Run as administrator] from the shortcut menu.

■ **Communication with the simulator cannot be established.**

When the Windows<sup>®</sup> Firewall is enabled and communicate with "VxSim Network Daemon" is not allowed, a timeout may occur. To allow the communication, refer to the following manual.

 CW Configurator Operating Manual

To allow the communication with "VxSim Network Daemon" according to the setting procedure in the above manual, click the "Browse" button on the "Add a Program"<sup>\*1</sup> screen to select "vxsimnetd.exe".

<sup>\*1</sup> For Windows<sup>®</sup> 8 or later, "Apps" is displayed instead.

When using other software with a firewall function, refer to the manual for the software used and allow the communication with "VxSim Network Daemon".

### Point

When the installation destination of CW Workbench and CW-Sim is "C:\WindRiver", the folder for "vxsimnetd.exe" is stored in the following destination:

- "C:\WindRiver\vxworks-6.9\host\x86-win32\bin"

For CW-Sim Standalone, the folder is stored in the local folder to which the files are copied.

- When the local folder is "C:\CCPUSIM": "C:\CCPUSIM\CWSIMSA\vxsimnetd"

# 13 LICENSE ERRORS

This chapter explains license errors that may occur when CW Workbench is started and being used.

## 13.1 License Errors

If a license error occurs when CW Workbench is started or being used, perform either of the following operations on the license error message.

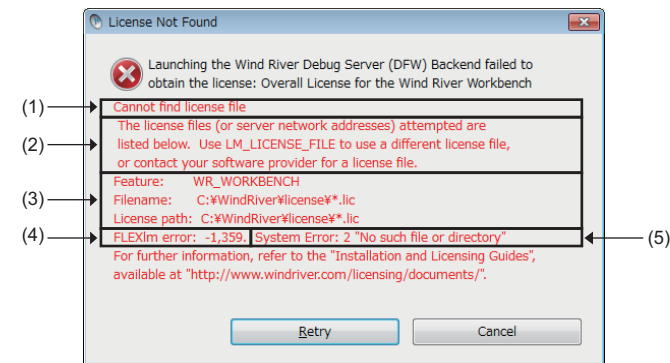
- Click the [Retry] button: The license check is repeated.
- Click the [Cancel] button: The license check is terminated, and CW Workbench continues to operate. However, some of the CW Workbench functions shown below will be disabled.

Functions that cannot be used	Functions that can be used
<ul style="list-style-type: none"><li>• Project creation</li><li>• Building</li><li>• Target connection</li><li>• Downloading</li><li>• Debugging</li></ul>	<ul style="list-style-type: none"><li>• Editor function (create, edit, save, and search)</li><li>• Importing</li><li>• Exporting</li></ul>

## 13.2 License Error Message

The error message, "License Not Found" shown below appears when a license error occurs. Check the error details.

### Window



### Displayed items

No.	Item	Description
(1)	Error text	Displays an error outline.
(2)	Error details <sup>*1</sup>	Displays error details, solutions, and measures to avoid errors.
(3)	Support information <sup>*1</sup>	Displays information such as a license file name and path information
(4)	FLEXlm error information	Displays the error number and minor number of a license error cause. A number used when an FLEXlm vendor provides support. Example) FLEXlm error: -1,359. <ul style="list-style-type: none"><li>• Error number: -1</li><li>• Minor number: 359</li></ul>
(5)	System error information <sup>*1</sup>	Displays an error number and error text at a license error occurrence.

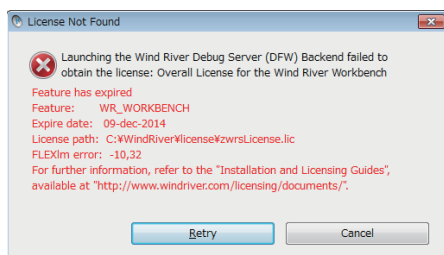
\*1 Not displayed in some errors.

## 13.3 Main License Error Messages and Recovery Procedures

This section shows license errors that may occur during operation of CW Workbench and how to recover from errors.

### Trial period expiration

If CW Workbench is used with a temporary license, the following message appears after 31 days have passed since the installation.



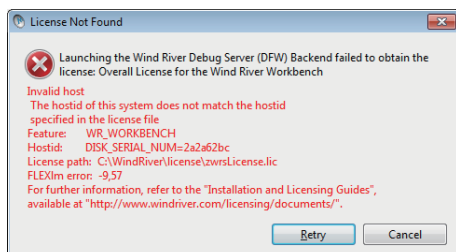
13

### How to recover from the error

Acquire a permanent license and overwrite the existing file to use CW Workbench.

### Using an invalid license

If there is an error in host information to be registered when a permanent license is acquired, the following message appears.



### Restriction

When 'DISK' is specified for 'Host Information' and a volume serial number other than the one on the C drive is specified for the Host ID, this error also occurs. Specify a volume serial number on the C drive for the Host ID. When there are multiple drives on the personal computer in use, do not specify a volume serial number other than the one on the C drive for the Host ID.

### How to recover from the error

Recheck the Host ID of the personal computer on which CW Workbench is used.

#### ■ If the Host ID is wrong

Apply for license transfer using License Transfer Certification Agreement Form (PermanentLicenseApplicationForm.xls) stored on the DVD-ROM. The Host ID to enter is as follows:

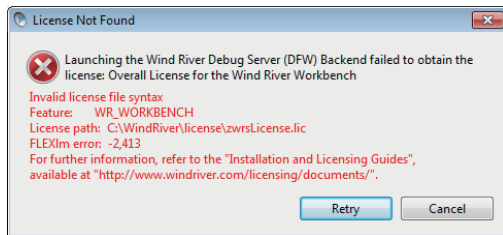
- Previous License: Enter the wrong Host ID registered last time.
- New License: Enter a new Host ID to be registered this time.

#### ■ If the Host ID is correct

Please consult your local Mitsubishi representative from which the CW Workbench was purchased.

## Using an installation key file

When CW Workbench has been installed using an installation key file, the following message is displayed at the startup of CW Workbench.



### How to recover from the error

Acquire a permanent license and apply the license file to the personal computer.



# APPENDIX

## Appendix 1 Installation and Uninstallation of Plug-in Software

This section explains how to install and uninstall the plug-in software, an extended function of CW Workbench.

### Point

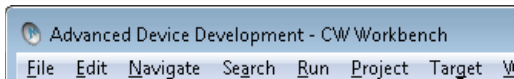
For details on the plug-in software functions, refer to the Wind River Workbench document provided by Wind River Systems, Inc.

[Help] ⇒ [Help Contents] ⇒ "Eclipse Platform" ⇒ "Eclipse Workbench Basics" ⇒ "Tasks" ⇒ "Updating and installing software"


## Installation

The following shows the installation procedure for the plug-in software.

Before installing the plug-in software, ensure that CW Workbench is in the "Advanced Device Development" mode.



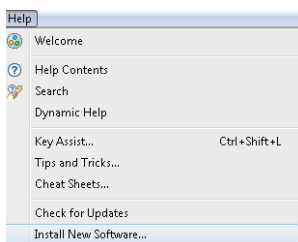
If "Basic Device Development" is displayed on the title bar, change it to "Advanced Device Development" by any of the following methods:

- Select [Window] ⇒ [Open Perspective] ⇒ [Advanced Device Development].
- Click the Open Perspective icon (  ) at the upper right corner of CW Workbench, and select [Advanced Device Development] from the displayed menu.

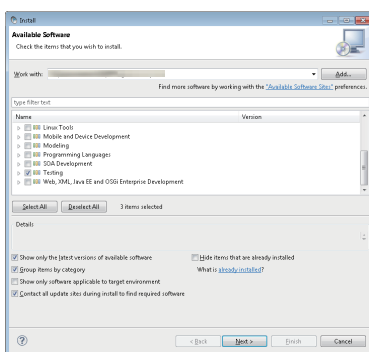
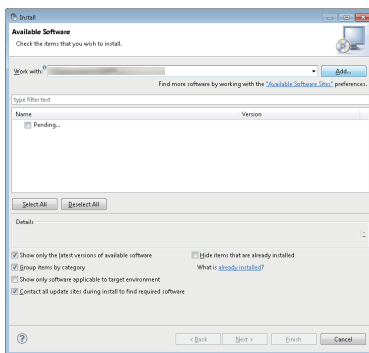
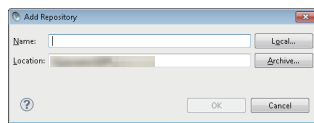
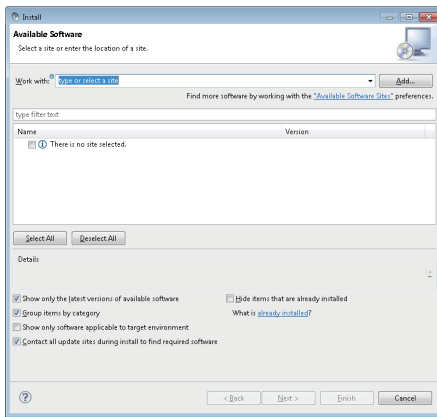
## Precautions

- The installation method of the plug-in software explained in this section is a general installation method using Eclipse3.6. Follow the instructions provided by plug-in software manufactures.
- For details on how to use the plug-in software installed, contact the plug-in software manufacturer.
- If the installed plug-in software does not operate properly, check if the plug-in software can be operated in Eclipse3.6 on public operating environment provided by the plug-in software manufacturer.

## Operating procedure



1. Select [Help] ⇒ [Install New Software].



2. Click the [Add] button on the "Install" screen.

3. Enter information for "Name" and "Location" field. Click the [OK] button.

A path of website, from which the plug-in software can be downloaded, is added.

An Archive file downloaded from the web site can be also selected for the "Location" field by clicking the [Archive] button.

4. The information of the software package that can be installed from the added Location is acquired.

"Pending" is displayed as shown on the left while the information is being acquired.

After the completion of acquiring the information of the software package that can be installed, software package names are displayed.

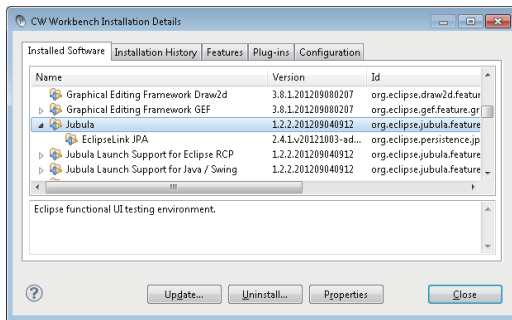
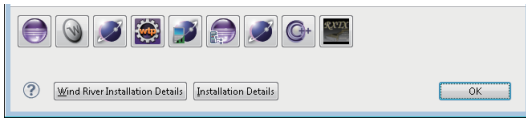
5. Select a software package to be installed, and click the [Next] button to install the plug-in software.

# Uninstallation

The following shows the uninstallation procedure for the plug-in software.

A

## Operating procedure



1. Select [Help] ⇒ [About CW Workbench] to display "About CW Workbench" screen. Click the [Installation Details] button.
  2. Select the [Installed Software] tab and select the software packages to be deleted.
  3. Click the [Uninstall] button.
- The plug-in software is uninstalled.

## Appendix 2 Comparison with Wind River Workbench

The following table shows the specification comparison between CW Workbench and Wind River Workbench.

○: Supported, ×: Unsupported

Item			CW Workbench	Wind River Workbench 3.3
Framework	Eclipse	Workbench basic function	Ver.3.6	Ver.3.6
Compiler	ARMARCH7gnu_SMP	Compiler for C Controller module (GCC for ARM Cortex A9 compiler)	○	○
	SIMNTgnu_SMP	Compiler for VxSim (GCC for VxWorks Simulator Windows compiler)	×	○
Project system and build system (Project creation and management)	VxWorks Downloadable Kernel Module Project	A project used for normal application development. Applications which are executed in the kernel mode of VxWorks 6.x are created.	○	○
Debugger	Target connection agent	A function to establish the communication with C Controller module for debugging.	○	○
	Wind River VxWorks Simulator	A simulation function to execute debugging by running the Wind River VxWorks application on the operating system without the actual devices.	×	○
	Download	A function to download a file to be debugged to C Controller module in order to have it ready for debugging.	○	○
	Debug operation	A function to debug the source code by the operations such as start or stop debugging and step execution.		
	Dynamic Printf	A function to dynamically insert or cancel the printf statement when debugging the program without adding the printf function to the source code with the similar operation as that of the breakpoint.		
Command-line interface	Target shell	A command-line interface which operates on the operating system of C Controller module.	○	○
Runtime analysis tool	Memory Analyzer	Identifies memory leaks by monitoring the memory usage.	×	○
	Performance Profiler	Analyzes bottleneck of tasks by conducting statistical analysis on coding status.		
	Data Monitor	Analyzes memory leaks by monitoring variables and data structures in real time.		
	System Viewer	Analyzes task execution order and deadlock by monitoring interrupt task status or CPU utilization, etc.		
	Code Coverage Analyzer	Checks which code segment is executed during the code testing phase.		
Extended functions	Extends function by installing plug-ins for a third-party provided function.		○	○

## Appendix 3 Function Comparison among CW-Sim, CW-Sim Standalone, and VxSim

The comparison of functions among CW-Sim, CW-Sim Standalone, and VxSim are shown in the following table.

○: Available, —: Unavailable

Item	Function	Description	CW-Sim	CW-Sim Standalone	VxSim
Introduction and management	Install and uninstall	Installs or uninstalls with a wizard.	○*1	—	○
	License management	Authenticates with license key.	○	—	○
Compiler	Diab compiler	Builds with SIMNTdiab as Wind River compiler.	—	—	○
	GNU compiler	Builds with SIMNTgnu_SMP as Wind River GNU compiler.	○	—	○
Debug	Source code debugging	Performs step execution or references and modifies variables.	○	—	○
Startup	Script startup	Execute script at startup.	○	○	○
VxWorks function	Real Time Process (RTP)	Executes programs in a user space.	—	—	○
	Multitasking	Uses system functions such as task management, inter-task communication, and event transmission/reception.	○	○	○
	POSIX standard interface	Uses interface specified for IEEE Std 1003.1 (base standard).	○	○	○
	I/O system	Uses standard interfaces for the access to various devices.	○	○	○
	Local file system	Uses MS-DOS-compatible file system (dosFs).	○	○	○
	Error detection and reporting	Performs debugging software failure.	○	○	○
	Shared data area	Shares memory mutually between processes.	—	—	○
	Shared library	Uses shared library which contains codes and data.	—	—	○
	VxMP (Shared memory object)	Uses shared memory that realizes high-speed synchronization/communication between tasks executed on different CPUs.	—	—	○
	VxFusion (Distributed message queue)	Uses dispersion mechanism on different CPUs based on VxWorks message queue.	—	—	○
	Wind River System Viewer	Uses System Viewer command server of VxWorks.	—	—	○
Simulated hardware	VxWorks console	Uses shell console by VxWorks system tasks.	○	○	○
	System timer	Uses timer generated from core clock used in VxWorks.	○	○	○
	Memory Management Unit (MMU)	Manages virtual memory independent of MMU architecture of CPUs.	○	○	○
	Virtual disc support	Simulates disc block devices.	○	○	○
	Time stamp driver	Displays time axis using Wind River System Viewer.	—	—	○
	Real time clock	Manages the updates of the time and calendar.	○	○	○
	Virtual network	Links to virtual network and external network by network daemon.	○	○	○

\*1 CW-Sim is also uninstalled by uninstalling CW Workbench.

# Appendix 4 List of VxWorks Components Differences between C Controller module and CW-Sim

This section shows the components of which operations run differently on CW-Sim and CW-Sim Standalone among VxWorks components implemented on C Controller module.

Difference	Description	Name
Addition	direct access to host filesystem	INCLUDE_PASSFS
	VxSim virtual disk to emulate a VxWorks disk driver	INCLUDE_VIRTUAL_DISK



For all VxWorks components implemented on C Controller module, refer to the following manual.

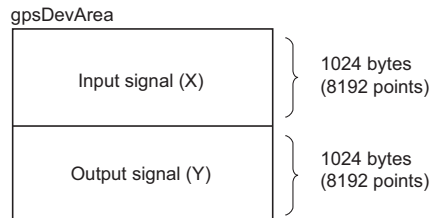
MELSEC iQ-R C Controller Module User's Manual (Application)

# Appendix 5 CCPU\_Simulator C Controller Module Dedicated Functions (Stub)

A

This section explains the stub provided in the sample program.

This function performs the simulation by using the variable in the sample program (gpsDevArea), instead of accessing to actual input signal (X) and output signal (Y).



Function name	Description	Reference
CCPU_X_In_BitEx	Simulate the read of input signal (X) in bit (1-point) units.	Page 121
CCPU_X_In_WordEx	Simulates the read of input signal (X) in word (16-point) units.	Page 121
CCPU_Y_Out_BitEx	Simulates the write of output signal (Y) in bit (1-point) units.	Page 122
CCPU_Y_Out_WordEx	Simulates the write of output signal (Y) in word (16-point) units.	Page 122
CCPU_Y_In_BitEx	Simulates the read of output signal (Y) in bit (1-point) units.	Page 122
CCPU_Y_In_WordEx	Simulates the read of output signal (Y) in word (16-point) units.	Page 123

## CCPU\_X\_In\_BitEx

This function simulates the read of input signal from the memory (gpsDevArea) in bit units.

### Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usXno	Input number (X)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)

## CCPU\_X\_In\_WordEx

This function simulates the read of input signal from the memory (gpsDevArea) in word units.

### Argument

Argument	Description	IN/OUT
sFlg	Dummy	IN
usXno	Start input number (X)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

### Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)

## CCPU\_Y\_Out\_BitEx

This function simulates the write of output signal to the memory (gpsDevArea) in bit units.

### ■Argument:

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Output number (Y)	IN
usData	Write data (0: OFF, 1: ON)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)

## CCPU\_Y\_Out\_WordEx

This function simulates the write of output signal (Y) to the memory (gpsDevArea) in word units.

### ■Argument:

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Start output number (Y)	IN
usSize	Number of written words	IN
pusDataBuf	Write data	IN
usBufSize	Dummy (Fixed to '0')	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)

## CCPU\_Y\_In\_BitEx

This function simulates the read of output signal from the memory (gpsDevArea) in bit units.

### ■Argument:

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Output number (Y)	IN
pusData	Read data (0: OFF, 1: ON)	OUT

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)



## CCPU\_Y\_In\_WordEx

This function simulates the read of output signal from the memory (gpsDevArea) in word units.

### ■Argument:

Argument	Description	IN/OUT
sFlg	Dummy	IN
usYno	Start output number (Y)	IN
usSize	Number of read words	IN
pusDataBuf	Read data	OUT
usBufSize	Data storage area (pusDataBuf) size (in word units)	IN

### ■Return value

Return value	Description
0	Normal end
-203	Abnormal end (I/O number error)
-204	Abnormal end (I/O access size error)
-210	Abnormal end (read area size error)

# Appendix 6 Support

## Technical support assistance service regarding C Controller module

For technical support assistance service regarding C Controller module, refer to the following table.

If the type to which your inquiry belongs is not sure, please consult your local Mitsubishi representative. Please note that any inquiries other than MELSEC related products may not be able to be answered.

Type	Inquiry	Contact
MELSEC	<ul style="list-style-type: none"><li>• Functions and specifications of C Controller module</li><li>• Specifications and usage of the dedicated function library provided by Mitsubishi Electric Corporation</li><li>• Functions and specifications of CW Configurator, CW Workbench, CW-Sim, and CW-Sim Standalone.</li><li>• Functions and specifications of the Mitsubishi products (modules and MELSOFT products) to be used with C Controller module</li></ul>	For further information and services, please consult your local Mitsubishi representative.
Operating system	<ul style="list-style-type: none"><li>• Functions and specifications of VxWorks, API functions provided by VxWorks, and general inquiries regarding programming related to VxWorks</li><li>• Functions and specifications of Wind River Workbench and Tornado</li></ul>	Wind River Systems, Inc. URL: <a href="http://www.windriver.com">http://www.windriver.com</a>
Plug-in software	<ul style="list-style-type: none"><li>• Plug-in software which is to be used with CW Workbench or Wind River Workbench</li></ul>	Plug-in software manufacturer

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# MEMO

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# REVISIONS

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